JULY 1960

AMERICAN ARTISAN

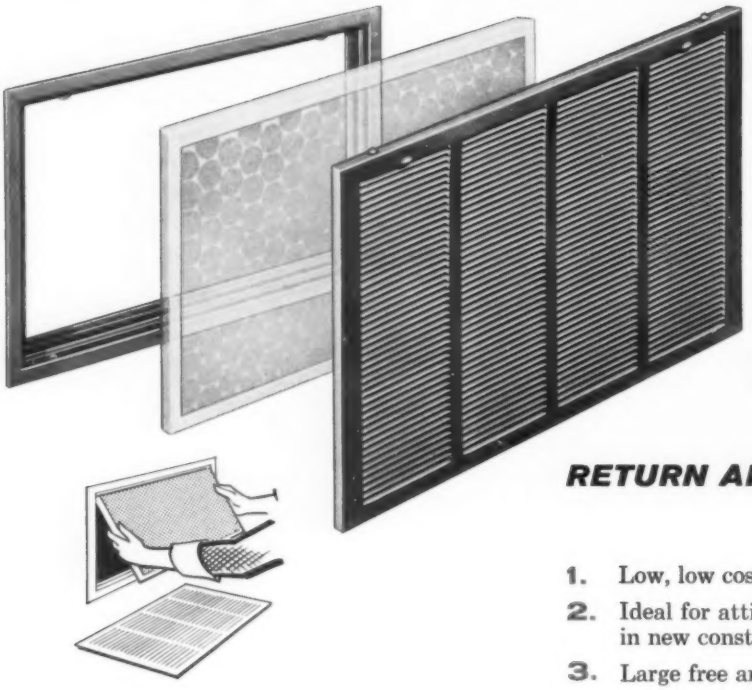
. . The Magazine of

CENTRAL RESIDENTIAL AIR CONDITIONING

WARM AIR HEATING • SHEET METAL CONTRACTING

Final inspection includes checking ducts and equipment against specifications . . . . . page 41

OBSOLETES HARD-TO-REACH FURNACE FILTERS!



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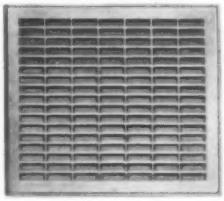

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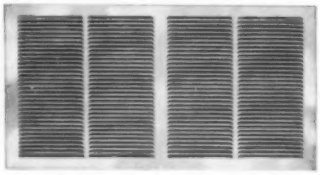

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AMERICAN ARTISAN

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JULY 1960

FEATURES

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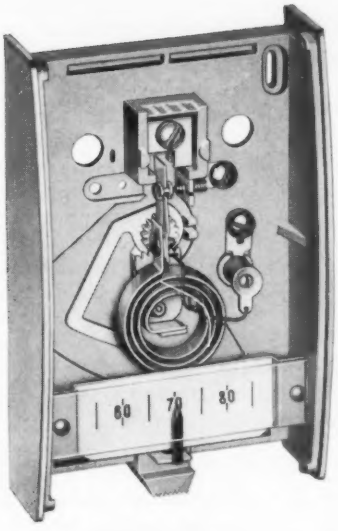

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the editor's notebook

Thumbing Through This Month's Artisan

. . . we find several dealer-contractors who are doing a profitable business in fabricating "special" sheet metal jobs. Both of these dealer-contractors have built a favorable reputation by giving customers what they ask for when it is to be made of sheet metal. Fabricating *Heavy Duty Ducts to be Used as Cable Conduits* is an old service for one firm who has specialized in making special equipment for electrical applications for many years. The other firm ran into a little difficulty when it was confronted with erecting a *Unique Tentlike Sheet Metal Roof that Required Fabricating the Panels at the Job Site.* Under normal circumstances this would not have been a difficult job but the roof had the general appearance of a half egg shell that had been sliced the long way.

Planning

. . . with care is a watchword that has paid off for this dealer-contractor because he is able to sell many of his systems even when lower bids have been submitted by competitors. *Careful Planning Pays Off In: Repeat Business — Comfortized Jobs — Continued Growth* shows the methods employed by this firm to build a reputation based on the principle of not installing "just a heating system" in the residential and commercial fields, but a system that is designed to provide comfort under all conditions. Comfort, in this case, does not mean heat alone, according to the dealer-contractor, who believes that a heating system should be

the editor's notebook *(Continued)*

designed to include adequate humidification equipment.

Selling

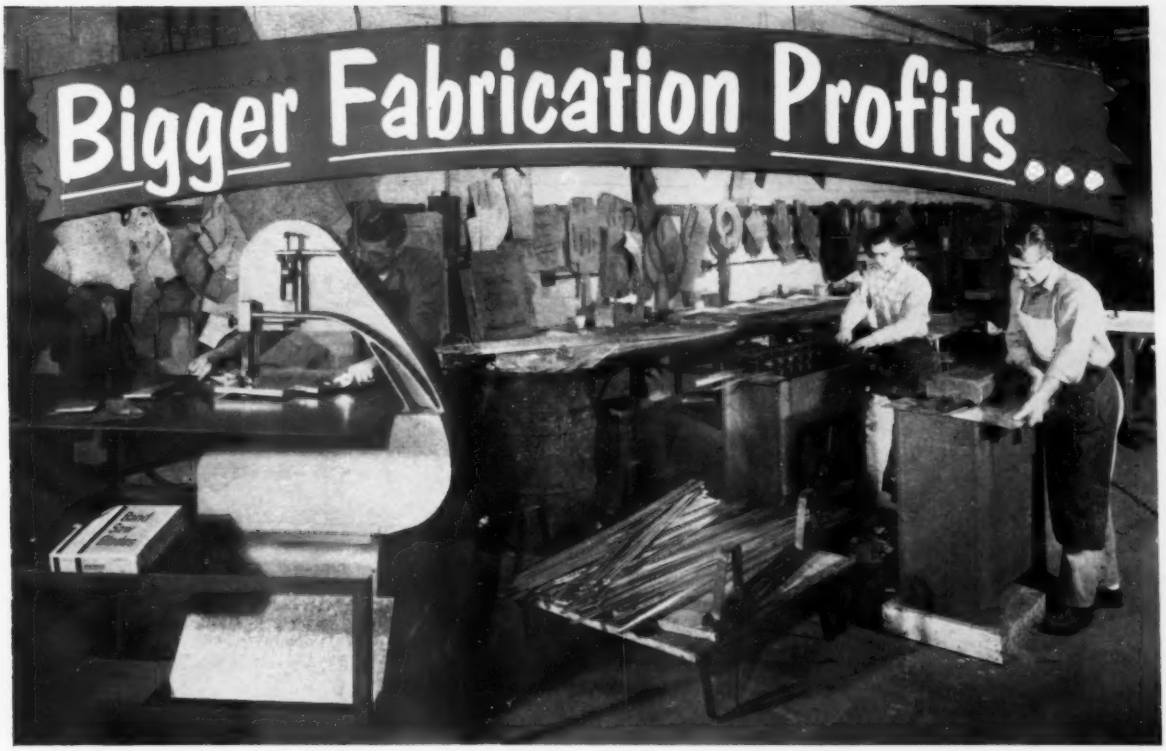
. . . architects on using the *Cooling Standards* card as a guide when writing specifications for year 'round air conditioning enables this dealer-contractor to submit bids that are higher than those based on equipment that only offers a small degree of relief from summer heat and humidity. *Use Cooling Standards to Inform Architects and Upgrade Prospects* shows how this dealer-contractor works with architects to design systems that provide conditions listed under the "Good" classifications on the *Cooling Standards* card that is published by the American Artisan.

These Qualities Mark Successful Businessman

Is THERE a formula for the successful management of a business? Perhaps not. But for the man in business or contemplating going into business there are check points which can prove valuable. Here are some of the general characteristics shared by successful businessmen. Check these points and ask yourself, "How do I measure against these requisites?"

Merchant Instinct

No man should engage in a business unless he has a liking for it — a quality usually identified by a desire to serve the needs of the community. Merchant instinct includes not only the urge to buy and to sell, but the desire to mix with other people in the neighborhood. It includes a friendly attitude toward customers, a willingness to suggest items, and



based on Lockformer Equipment

Here's another sheet metal fabricating plant that produces more in less time, sells more at bigger profits because production is based upon Lockformer equipment. One Chicago producer of standard and special pipe, duct and fittings, runs locks, cleats, flanges, patterns . . . almost anything on such Lockformer equipment as—

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The Cleatformer rolls drive cleats and "S" cleats 10 to 20 times faster than by other methods. A true production machine, it rolls all the cleats any plant could need.

The Lockformer 24S Band Saw, with a full 24" throat, and the Model 14SM, with 13½" throat, handle the cutting jobs . . . including stainless steel and up to 50 stacked sheets at a time. With 3 speeds available and lots of power, they're built for production and profits. Lockformer Band Saw Blades, too, provide best results, longest life.

Then there's a 12" model Lockformer Cheek Bender that turns out perfect bends every time in material up to 20 gauge. It's built to last a lifetime.

And that's how one fabricating plant stays competitive whether the jobs are run in lots of 5 or 500. You too can bid lower to land more jobs and make more money on the jobs you land. Send for the latest catalog of Lockformer machinery and equipment to handle any sheet metal job.

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TIME SAVING, MONEY MAKING EQUIPMENT

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their application to a problem. It includes a lively interest in community affairs —not as a time-wasting busybody, but as a worker for the social and business betterment of the neighborhood. When people say of a businessman, "He is a born merchant," they mean he is dedicated to a career of service to his customers and his community.

Know-How

This broad term includes experience in the line or trade, understanding of the product or service, and skill in its use, application, or benefits. We are living in a period of rapid change in products and shifts in techniques. New appliances are coming on the market to fit radical changes in the consumer's home or place of business. New fibers and styles are influencing all types of apparel. New foods are packaged for kitchen use. Know-how includes a complete understanding and rounded experience to meet any situation or emergency arising out of our daily work of running a business.

Buying Skill

Knowing how to buy, where to buy, and what to buy is a primary step to good management. Having the wrong items on the shelf results in sluggish inventory and eventual sales at unprofitable markdowns. Timing in buying is a necessary asset to high sales turnover at a profit. A good supplier is always a friend in need. When all other things are equal, a retailer stays with the supplier who sticks with him in good times or bad. Keeping "open to buy" means a reserve buying power to be used when the opportunity presents itself. Buying skill implies a knowledge of customer needs and supplier markets. It also includes a bargaining instinct and the ability to say "No" in the face of high pressure tactics.

Selling Skill

Here is where psychological as well as technical knowledge influences volume and profits. Selling skill begins with a knowledge of community tastes and requirements. Styles and sizes differ in certain regions due to economic or climatic conditions. Tastes in packaged, canned or frozen foods vary according to the nature of the community Selling includes an understanding of price ranges, mark-ups, inventory controls, merchandising techniques, and counter and window displays. Incidentally, the good sales manager in a retail operation is also a good housekeeper.

Financial Management

Profits are the test of management capacity. If you want to stay in business you have to earn a profit on your invested capital. Every business, no matter how small, should have the benefit of an accountant's advice. Financial management begins with an understanding of the basic economic facts of life. The capital of a business goes through a time cycle in which the funds invested in inventory, labor, and rent must come back with a net gain. The experienced businessman sets up a financial program, budgets his expenses, and knows at all times where he stands. Furthermore, he knows the trend of his business as compared to general conditions, and the competi-

SOLID, MAN, SOLID! Strum a LIMA REGISTER and you'll hear no tinny sound! What you hear is solid rigidity —the sound of all-welded construction that makes your cash register ring! Yes, you and the Lima line will make sweet music together on heating-cooling jobs. Send for the latest Lima catalog of Registers, Diffusers and Grilles.

PUT **LIMA** QUALITY IN YOUR INSTALLATIONS • **LIMA REGISTER CO., LIMA, OHIO**

the editor's notebook

(Continued)

tive situation of other distributors in his line.

Record Keeping

The businessman who is careless in his record keeping invites trouble in several directions. Without adequate knowledge of the age, condition and rate of turnover in his stock, he is playing blind man's bluff with profit margins, and may stumble badly on inventory errors. If he doesn't keep adequate daily, weekly or monthly sales records he is ignoring the visible guidance sales information provides. If he doesn't keep a day-to-day record of expenses out of petty cash, his bookkeeper or accountant may find an unexplained shrinkage in cash on hand. With the demands of the tax collector always before us, accurate record keeping is a must, no matter how irritating the task may be. Bad management and poor record keeping usually go together in a failing business.

Taking Advice

Good counsel on management comes from the voice of experience and usually from a successful operator. However, even a sadder but wiser failure can point out the pitfalls he overlooked in his career. The "Monday morning quarterback" is in business as well as in sports, but seldom has anything to contribute except "I told you so." The best advice comes before you buy, sell, expand, invest, or move. Your local accountant, banker, lawyer, or trade association secretary, all of whom are familiar with your point of view as well as your ambitions and obstacles, can offer worthwhile advice. Listen to them, but use your own judgment,

the editor's notebook

(Continued)

too. It's your money, your profits and your future. When you make a decision, don't shillyshally about puting the decision in action. Courage makes occasional mistakes, but never as many as that of cowardice which makes the bigger mistake of avoiding or delaying decisions.

Integrity

Integrity is a quality rather than a skill or talent. There is no more valuable asset to a businessman than a reputation for being "a man of his word." Customers like it and come back. Suppliers like it and back you up when things get tough.

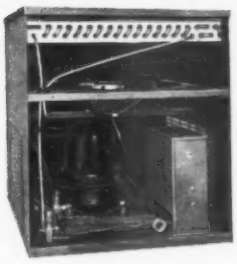
Integrity is more than honest weight or measurement; it is more than prompt payment of suppliers' bills, taxes, or salaries. It is a hidden quality which comes to life under stress or challenge, when it would be easier, or temporarily more profitable, to step aside from a candid statement of fault or responsibility. Integrity is hard to convert into cash but it's worth all your tangible assets put together.

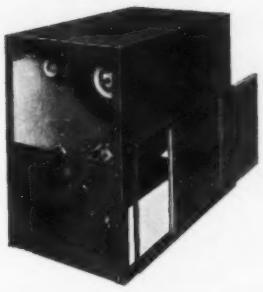
Naturally, some of the qualities outlined parallel and overlap. Know-how is an overall appraisal. Buying and selling skills are specific. Merchant instinct is a bit abstract, while financial management is a carefully defined area of action and judgment. Record keeping is a special business virtue, while integrity is a moral quality unrelated to skills.

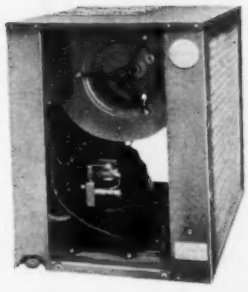
Must Know Your Goals, SBA Tells Businessmen

LAST MONTH the need for self-improvement was outlined in this column. This month, the necessity for hav-

The HOTTEST DEAL in SUMMER COOLING







New . . . 2 or 4 Ton Condensing Unit Top-mounted condenser coil . . . operating noise reduced to minimum . . . outdoor installation.

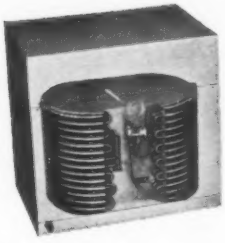
Round, Plenum Evaporator . . . more surface in less space . . . vertical condensate drainage.

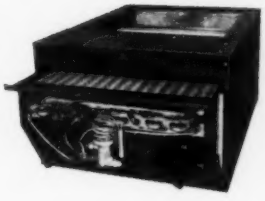
New . . . 3, 4 or 5 Ton Blower-Evaporator Unit . . . vertical or horizontal discharge . . . end, top or side intake. (Shown vertical with side intake.)

Flat, Duct Evaporator . . . heavy gauge enameled cabinet . . . built-in drain pan.

3 or 5 Ton Condensing Unit . . . top discharge with centrifugal blower . . . unsheltered outdoor installation.

Counterflow Evaporator slides into accessory cabinet . . . zinc coated drain trays.





The phenomenal sales of the new Moncrief Air Cooled Condensing Units and companion Evaporator Coils leave no doubt that Moncrief means business in summer cooling — extra business for you.

With a complete line of 2, 3, 4 and 5 Ton Units — low prices — uncomplicated design and rugged construction — easy installation and service — and prompt delivery from our own manufacturing plant — Moncrief puts you in the air conditioning business the competitive, profitable way.

In addition, Moncrief gives you outstanding features to sell — Condensing Units with 16-gauge, zinc-dipped cabinets and upward air discharge — the unique, circular Plenum-Type Evaporator — the versatile Blower-Evaporator for either horizontal or vertical air discharge — and furnaces with plentiful blower capacity built-in to handle air deliveries for cooling.

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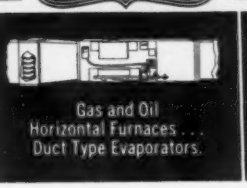


Gas and Oil Horizontal Furnaces . . . Duct Type Evaporators.

Gas or Oil Basement A. C. Units . . . Plenum Type Evaporators.

Gas or Oil Combination Year 'Round A. C. Units . . . Air or Water Cooled.

the editor's notebook

(Continued)

ing clearly defined objectives in mind when embarking on a program of self-improvement will be discussed.

Dr. Jerome C. Beam, writing in Small Marketers Aid No. 46 of the Small Business Administration, says:

"Before you try to start a program of self-improvement, you have to know what your goal is. This is true even if you are managing a small company right now. It is certainly true if you're just on your way up the commercial ladder. If you are a relative newcomer to business, you have the opportunity to think ahead and plan your future. Do you want to be the head of a one-man operation or a somewhat larger unit where you have a number of people working for you? Do you want to manage a small retail, wholesaler or service organization?

"If you're an old hand at managing, you still should have a good look at both your organization and your own goals. For instance, are you satisfied with the type of business you manage? Are you glad that you have only a few (or, respectively, quite a few) people working for you? And is your goal simply to make money, or are your aims broader than that? At times, you may have wondered if you'd do better elsewhere. You are, after all, experienced in the art of managing a business, and managing one business (you are certain) is much like managing any other. Consider, however, the following case history:

"Jonathan Baker was the manager of a fairly small company and had proved highly successful in his job. He was aggressive, and aggressiveness is usually thought of as a desirable quality in an executive.

"Luckily for Baker, the owner of the firm was more of a thinker and a long-range planner. He was definitely not the aggressive type. So Baker and the owner complemented each other and together made a success of the business.

"Then one day Baker received a tempting offer from another organization to take over as its manager. He accepted. On the surface, the two enterprises had much in common. Both were relatively small and in the same line. There was one trouble, however, which Baker failed to foresee. His new boss, like Baker himself, was an aggressive man. He was also uncertain of himself, and not too pleased when he discovered that his new manager was aggressive and forceful, too. Deliberately, he frustrated every move Baker made. In no time at all, the two men clashed head on, and Baker, in disgust, left the company.

"Baker's experience is a warning to newcomers and old-timers in business alike: It proves that a manager's essential personal qualities can be identified in a general way only. But it's far harder to pin down the specific qualities he has to have. What they should be depends on: a) the type of firm he operates, and b) the type of man he himself is."

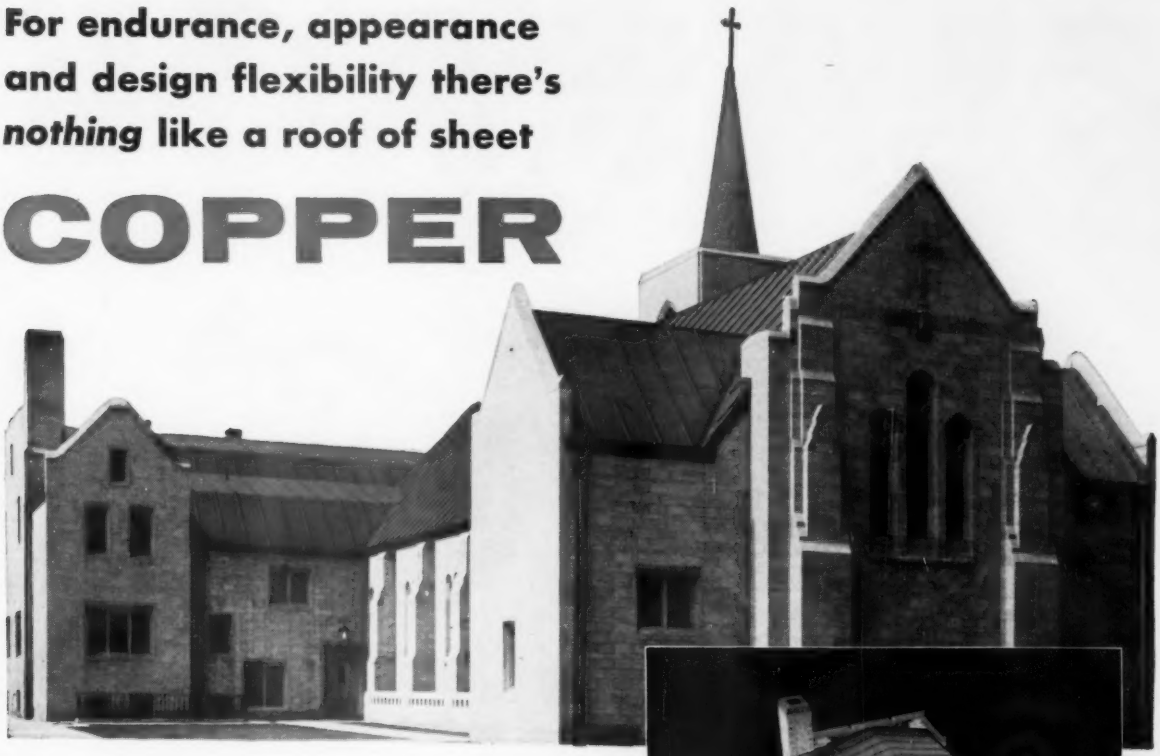
These are but a few of the points that a businessman must consider when he is about to undertake self-improvement, according to Dr. Beam. Other factors will be outlined during the next few months in this column.

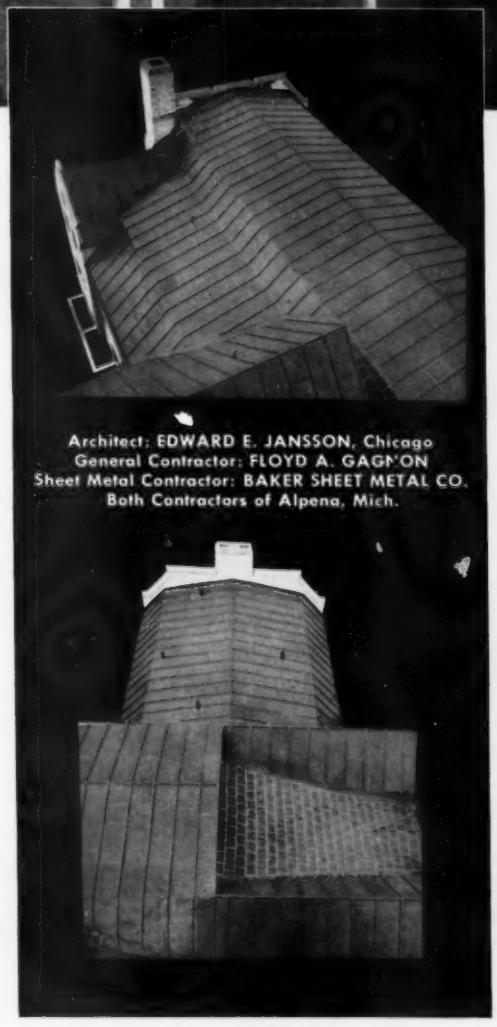
Clyde M Barnes

Editor

For endurance, appearance and design flexibility there's *nothing* like a roof of sheet

COPPER





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Traditional, modern, you name the design . . . no matter what you call it, copper is at home with all of them. An excellent example of the versatility of copper is shown by the combination of the batten and flat seams in photos shown at right.

This most versatile of metals is also the most enduring. And because of its workability into any shape or form and the ease with which it is soldered, copper is the preference of architects, engineers and contractors alike.

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SEE OUR CATALOG IN SWEET'S FILE.

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General Contractor: FLOYD A. GAGNON
Sheet Metal Contractor: BAKER SHEET METAL CO.
Both Contractors of Alpena, Mich.

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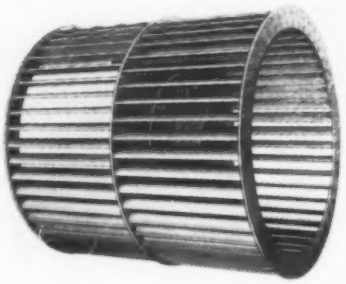

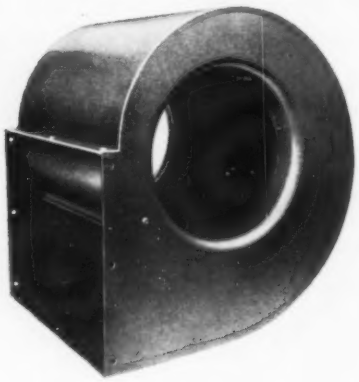

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OVER 20 leading manufacturers incorporate this Clarage equipment

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Learn more . . . contact our nearest office or write us direct for complete information.

Dependable equipment for making air your servant

CLARAGE FAN COMPANY

Kalamazoo, Michigan

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

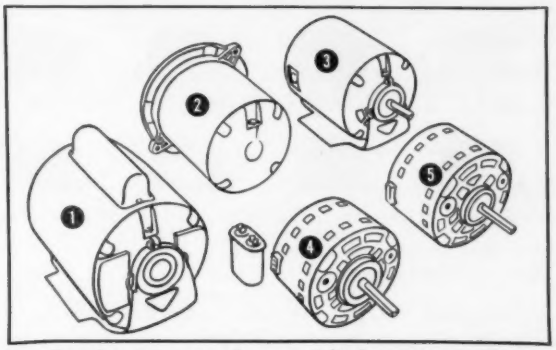
When you need a motor for heating equipment

CHANCES ARE 100 TO 1 IT'S HERE

. . . because these motors represent General Electric's complete line of years-ahead motors for oil burners and belt- or direct-drive furnace blower applications.

They'll provide *extra reliability* because of their built-in quality, the result of G-E engineering know-how and manufacturing experience. You'll find them *easy to install*—because they're light and small, and built with your requirements in mind. And General Electric offers *fast, local service*—the result of a nationwide network of motor service stations, backed by twenty General Electric service experts who keep these stations up-to-date on the latest motor service techniques.

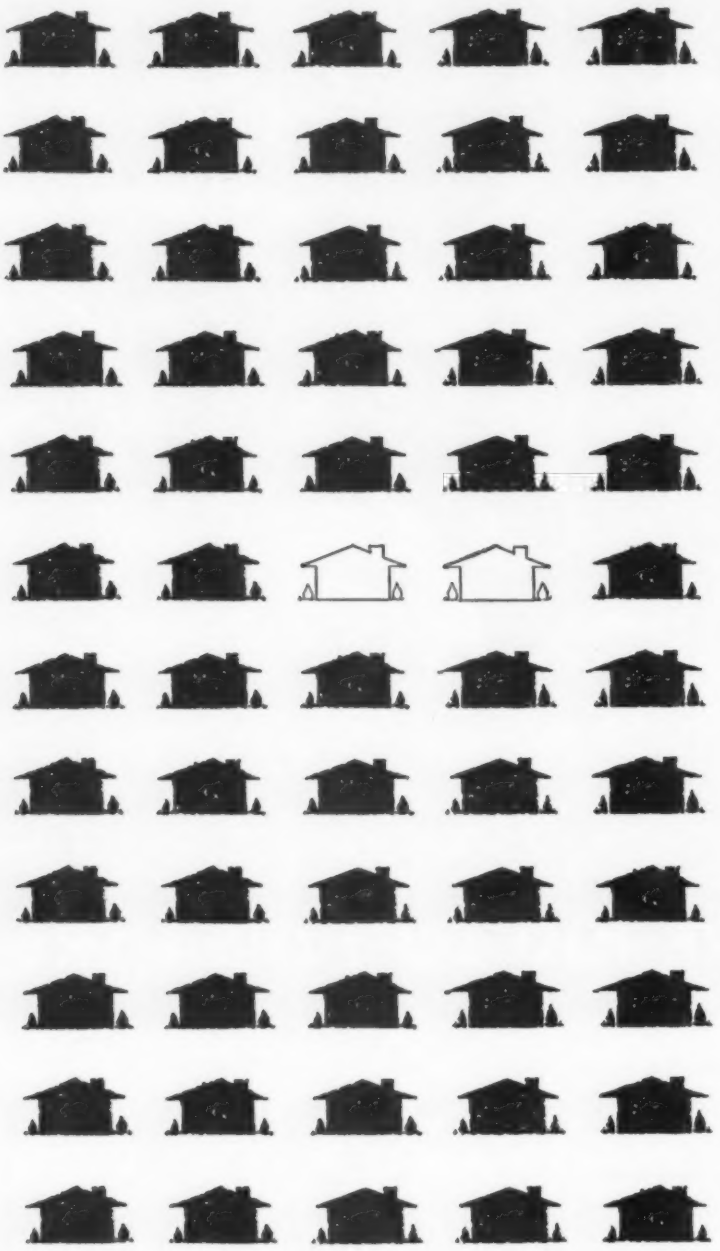
That's what we mean when we say you get MORE THAN A MOTOR with General Electric Form G motors. You'll find it pays to specify General Electric Form G motors on the heating equipment you install. And replacement motors are available at your local G-E distributor. For more information write to Section 738-12, General Electric Company, Schenectady 5, New York.



1. Capacitor-start motor for belt-driven applications
2. Oil-burner motor
3. Split-phase motor for belt-driven applications
4. Permanent split-capacitor motor for direct-drive applications
5. Shaded-pole motor for direct-drive applications.

Progress Is Our Most Important Product

GENERAL ELECTRIC



You can replace 98% of the oil burner filters in your territory with just four PUROLATOR elements

With a small inventory of just *four* Purolator filter elements, you're set to handle the replacement needs of 98% of the oil burner filters on the market—old ones, new ones, and most of the odd sizes.

Once you've installed a Purolator you're set for a long time. Purolator elements filter finer (down to 0.0005″) and longer (they last a year or more without servicing) than any other filter element on the market. With Purolator, you'll be spared the usual emergency calls to replace nozzles that have failed because of abrasive dirt. And a year or more from now, at replacement time, you'll appreciate the way the Purolator element pops out on a spring to make replacement neat and easy.

Purolator has a cross-reference chart that shows you which Purolator elements will fit which brands of oil burner filters. You can get a free copy of the chart by filling in the coupon and sending it to Purolator Products, Inc., Rahway, New Jersey.

Purolator Products, Inc., Dept. 2578
Rahway, New Jersey

Please send me the Purolator Cross Reference Chart showing the correct Purolator filter element for eight major brands of oil burner filters.

*Name*_____

*Company*_____

*Address*_____

*State*_____ *City*_____ *Zone*_____

Filtration For Every Known Fluid

PUROLATOR
PRODUCTS, INC.
RAHWAY, NEW JERSEY AND TORONTO, ONTARIO, CANADA

PROFIT WITH THE LEADER OF THE CUSTOM HEATING MARKET SELL THE NIAGARA SERIES 50 AIR CONDITIONER

Quality and performance are the two most important factors required today to meet the heating demands of the replacement and custom heating markets.

The NIAGARA Series 50 Air Conditioner more than fulfills these two requirements.

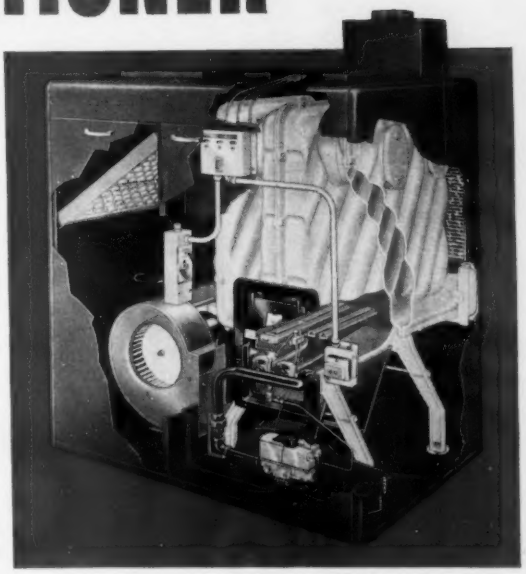
Here is truly an exceptionally deluxe furnace with *PROVED DEPENDABILITY* and *PROVED ECONOMY*.

One of the most significant features of the NIAGARA Series 50 is the famous NIAGARA cast-iron heat exchanger with copper-chromium-iron alloy combustion chamber, guaranteed for 20 years.

In addition, a 3-speed direct-drive blower, completely automatic controls, and a rich, modern-styled cabinet go together in making the NIAGARA Series 50 the finest heating unit available for the discriminating, quality-conscious buyer.

For summer cooling a NIAGARA refrigerated air-cooling unit can be added to work in conjunction with the Series 50 furnace.

Available in various capacities, the NIAGARA Series 50 will give customers years of utmost comfort with trouble-free operation—and will provide you with a greater profit.



Cut-a-way view of NIAGARA Series 50

NIAGARA SELLS A COMPLETE LINE

The NIAGARA Series 70 furnace line includes upflow, counterflow, basement or horizontal models, that burn gas or oil, and are available in capacities to fit every requirement. This budget line is built to the same high standards of quality as the Series 50.

NIAGARA Series 70 Basement Model

MAKE NIAGARA YOUR PROFIT LINE

Right now there are opportunities for choice NIAGARA dealerships.

Write or phone for full particulars on how you can Sell the NIAGARA line and Profit with the Leader.

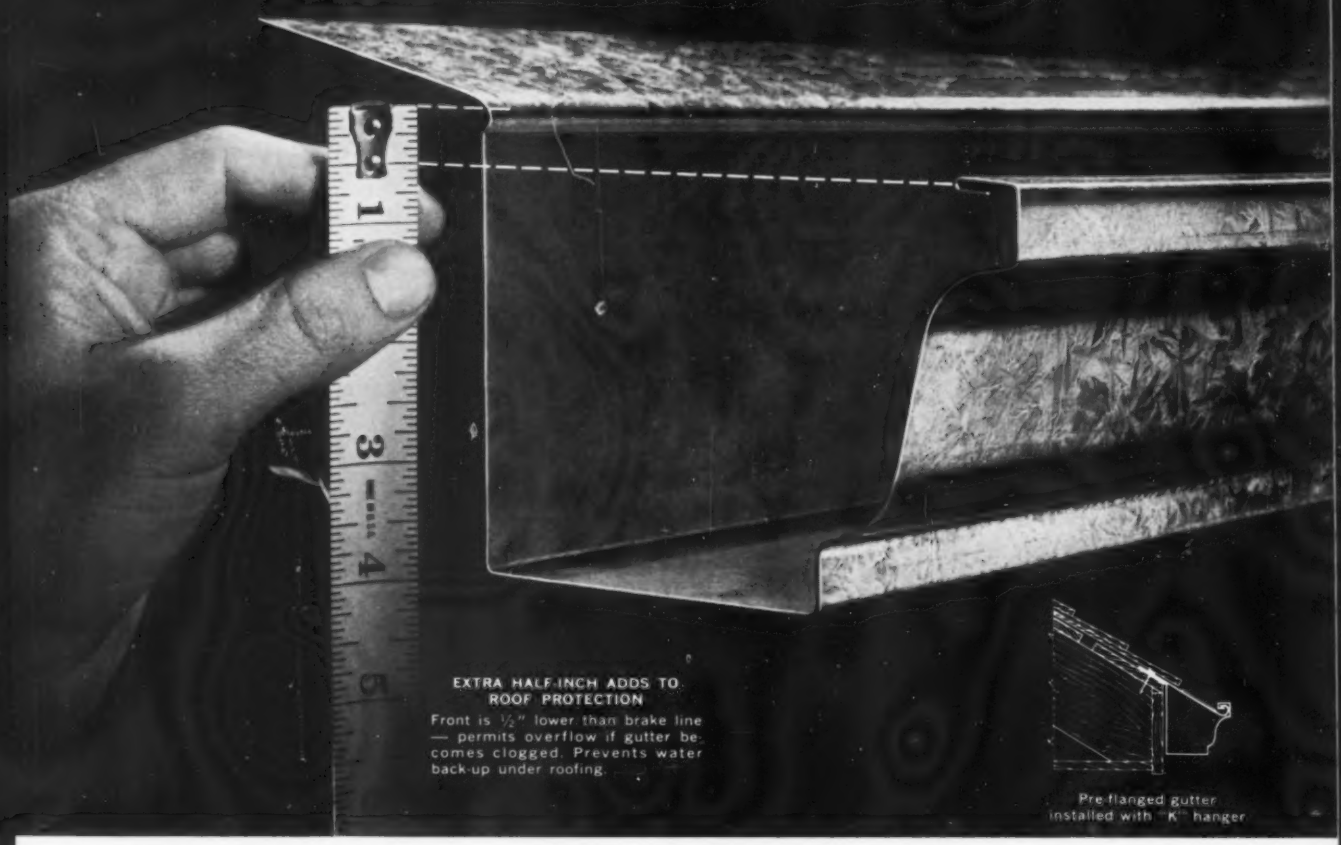
NIAGARA FURNACE DIVISION

THE FOREST CITY FOUNDRIES COMPANY

2500 WEST 27th STREET • CLEVELAND 13, OHIO

PHONE—TOwer 1-5040

NEW MILCOR PRE-FLANGED HIGHBACK GUTTER



EXTRA HALF-INCH ADDS TO ROOF PROTECTION

Front is ½" lower than brake line — permits overflow if gutter becomes clogged. Prevents water back-up under roofing.

Pre-flanged gutter installed with "K" hanger

CUTS YOUR JOB COSTS THREE WAYS

1. You eliminate flashing! Back flange of gutter covers and protects the edge of the roof. Saves cost of separate roof edge installation.

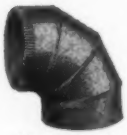
2. You eliminate a brake operation! Each length of Milcor Pre-flanged Highback has the roof flange already formed.

3. You finish jobs faster! Style K Gutter Hanger is hooked into open hem of front bead and nailed to roof boards, fastening front and back of gutter in one operation — fastest installation method in use today!

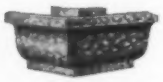
Try it on your next job. Furnished in 4" and 5" sizes; 10-ft., 20-ft., 25-ft., 30-ft., and 32-ft. lengths; 28 ga. and 26 ga. Ti-Co Galvanized Steel. See your jobber or write us for further information and prices.

One dependable source for all your sheet-metal products

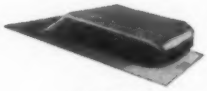
You can stake your reputation on a Milcor Installation.



Heating and Air Conditioning Products



Roof Drainage Equipment



Ventilators

MILCOR® Member of the INLAND Steel Family

(Member of Roof Drainage Manufacturers' Institute.)

INLAND STEEL PRODUCTS COMPANY

DEPT. G, 4023 WEST BURNHAM STREET, MILWAUKEE 1, WISCONSIN

SM-2

BALTIMORE, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, DETROIT, KANSAS CITY, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, NEW ORLEANS, NEW YORK, ST. LOUIS

48 Manufacturers Participating In ARI Program

WASHINGTON, D. C.—Forty-eight manufacturers, producing more than 90 percent of all unitary air conditioning equipment, are now participating in the unitary certification program, according to the Air-Conditioning and Refrigeration Institute.

Participants in the program agree to comply with ARI testing and rating procedures and to certify their ratings to ARI. In return, they may display the ARI "Seal of Certification" on their unitary equipment.

Expenditures for Goods, Services Now $498 Billion

CHICAGO — Expenditures of the nation's consumers, businesses and governments for goods and services rose to an estimated annual rate of $498 billion in the first quarter of this year, according to the "Business and Economic Review" of the First National Bank of Chicago. This represents an increase of 3 percent above the level of the final quarter of 1959 and a 6 percent gain from the same quarter a year ago.

Approximately one-quarter of the rise in total expenditures in the first quarter was due to higher consumer outlays, the Review points out. Individuals increased their buying by one percent over the fourth quarter with expenditures for services and durable goods rising somewhat more rapidly than soft goods purchases. The quarterly rise in these outlays was somewhat less than the rise in

(*Continued on page* 22)

Committees Discuss New Data, Manual Revisions

NWAHACA TECHNICAL DIRECTOR Herbert T. Gilkey (standing) puts a point across during meeting of air conditioning load calculation committee. From left are: James T. Lawson (facing speaker), administration manager of NWAHACA of Canada; Robert A. Hoehne, Mueller Climatrol Div. of Worthington Corp.; Walter Weiss, American Furnace Co.; Herbert G. Hays, Armstrong Furnace Co., Div. of National Union Electric Corp.; Mr. Gilkey; John L. McManus, McManus Heating & Refrigeration Co.; G. R. Munger, Owens-Corning Fiberglas Corp.; Donald E. Perry, Carrier Corp.; and Robert J. Evans, A. O. Smith Corp.

CLEVELAND — Newly developed values of heat transfer through ducts under varying conditions was the principal subject under discussion at a recent meeting of the National Warm Air Heating and Air Conditioning Association's technical data committee. It was pointed out that the rate of change of duct air temperature depends upon four things:

1) Difference between the temperature of air within the duct and of air surrounding the duct.

2) Velocity of air in the duct.

3) Size and shape of duct.

4) Insulating characteristics of the enclosing material.

On the basis of the newly developed information, the association will include in its manuals design data for duct systems not included in the conditioned part of the house.

A common application for the use of this data is in the design of distribution systems located in attics, where, NWAHACA points out, temperatures sometimes range as high as 140 F. The committee was particularly concerned with insulating factors which affect the delivery of conditioned air from the unit to the user area, as high attic temperatures could cause enormous heat gains if ducts located in those areas are inadequately insulated.

Chairman of the committee is Robert J. Waalkes, Hart & Cooley Mfg. Co. Serving with him are W. Russell Hendrick, Janitrol Heating and Air Conditioning Div., Midland-Ross Corp., and Hal H. Rhea, Carrier Corp.

The air conditioning load calculation committee also met recently for a two-day session to determine revision needs for manuals 3 and 11 of NWAHACA's 15-manual library. This group is composed of 11 members, and is headed by Alwin B. Newton, York division of the Borg-Warner Corp. It meets semi-annually.

(*More news on page* 22)

SOFTITE BY WHEELING

COP-R-LOY

"Finest galvanized sheet of them all!"

—That's what sheet metal men say about Wheeling SOFTITE Galvanized Sheets. Here are three big reasons for this acclaim:

1. SOFTITE sheets work easier because they are soft and ductile.
2. SOFTITE's galvanized coating is applied so tightly it actually becomes part of the steel base . . . can't flake or peel no matter how you twist or torture it!
3. SOFTITE, made of Cop-R-Loy, lasts longer . . . gives more years of service for your customer's dollar.

Buy the galvanized sheet that makes your job smoother . . . and your customers happier. Order Wheeling SOFTITE from your Wheeling man today. Wheeling Corrugating Company, Wheeling, West Virginia.

WHEELING CORRUGATING COMPANY • IT'S WHEELING STEEL!

WHERE TO FIND THE NEAREST WHEELING WAREHOUSE

BOSTON
2 Thompson Square
Charlestown District
Boston 29, Mass.
Charlestown 2-4770

BUFFALO
1722 Walden Ave.
Buffalo 25, N. Y.
Keystone 7444

CHICAGO
2547 Arthington St.
Chicago 12, Ill.
Seeley 3-5700

COLUMBUS
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Columbus 12, Ohio
Hudson 6-4318

DETROIT
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Dearborn 1, Mich.
Luzon 4-2005

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Grand 1-4141

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Melrose 4-0641

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Minneapolis 18, Minn.
Sterling 9-7233

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New Orleans 1, La.
Jackson 5-2291

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Stillwell 4-8580

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3rd and Bristol Streets
Nicetown Station
Philadelphia 40, Pa.
Davenport 9-1600

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Richmond 24, Va.
Belmont 3-6936

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St. Louis 10, Missouri
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Cedar 3-2200

HOUSTON
1303 Prudential Bldg.
1100 E. Holcombe Blvd.
Houston 25, Texas
Jackson 5-2692

(Continued from page 19)

20 Million Homes Heated by Gas

NEW YORK CITY — Homes heated by gas totaled 20.2 million in 1959 — up 6 percent from the previous year, according to the American Gas Association. The association estimates nearly 1,000,000 more customers will be heating with gas by the end of 1962.

More than one-quarter of the heating customers the industry expects to add by 1963 will be located in the East North Central states, where nearly 1.1 million installations are anticipated. This area includes Illinois, Indiana, Michigan, Ohio and Wisconsin. The Pacific region — California, Oregon and Washington — will rank second, with an estimated 641,000 additions. Ranking third is the Middle Atlantic area, including New York, New Jersey and Pennsylvania, where 521,000 new customers are expected.

Industry, College Work to Attract More Air Conditioning Students

SAN LUIS OBISPO — California State Polytechnic College's air conditioning and refrigeration engineering department reports that its graduates enjoy excellent acceptance by the air conditioning and refrigeration industry. "However," according to Harold P. Hayes, former dean of engineering and now dean of the college at San Luis Obispo, "industry needs more of them. One way that such colleges as Cal Poly can obtain the right kind of able young men for this training is through the industry itself. I am sure many firms have in their employ capable and serious young men who would make excellent air conditioning engineers." The dean urged that air conditioning firms "funnel such youngsters to the colleges which give the kind of training that the industry wants."

Currently, he said, Cal Poly's air conditioning and refrigeration department and the industry are working together on a cooperative publication to interest good prospects. The Western Air Conditioning Association and the college have jointly issued a brochure that quotes viewpoints of some students now in training; presents industry comments; and outlines the college's curriculum.

Housing Outlook Good But No New Boom Expected

NEW YORK CITY—"Outlook for housing for the next five years can be described as quite promising, but no new boom is immediately ahead." This was the forecast made by Walter E. Hoadley Jr., treasurer, Armstrong Cork Co., in addressing delegates to the recent convention of the National Federation of Financial Analysts Societies. Mr. Hoadley pointed out that new home building will reflect great public interest in better housing, but will be "influenced noticeably by the availability and cost of money, changes in public policies, and the degree of attractiveness of the housing values offered to prospective buyers."

Discussing the modernization picture, he said that modernization of the more than 50 million existing homes will continue to offer "a substantial volume of business" for materials and equipment manufacturers as well as interested builders.

Profits in the home building and modernization field, Mr. Hoadley said, "will reflect the extent to which managements grasp the dynamics of housing, initiate sound changes, insist upon high quality and efficiency, merchandise aggressively, and continually offer new specialized products and services which can be expected to have a strong demand in the market."

U.S. Spending More On Goods and Services

(Continued from page 19)

consumer income after taxes. Individuals added 7.1 percent of their available income to savings, up from the 7.0 percent rate of the final quarter of 1959 and the average of 6.9 percent for last year.

A slight rise in goverment purchases accounted for almost 10 percent of the increase in total expenditures. State and local goverments increased their outlays by 4 percent, continuing a trend that has persisted throughout the postwar years. Federal outlays, however, declined further during the quarter continuing the trend of approximately the last year as defense purchases dropped by about one percent.

GAMA Divisions Elect Officers

WHITE SULPHUR SPRINGS, W. VA. — Product divisions of the Gas Appliance Manufacturers Association elected their division officers and executive committees during the recent GAMA annual meeting. New officers, named in

(Continued on page 25)

THE TRULY VERSATILE COMBINATION GAS VALVE
VERSATROL . . . BY GENERAL CONTROLS CO.

A basic VERSATROL combination consists of the valve body and main line safety shut-off. Main gas cock, pilot valve and 100% safety are optional. Take your choice from four valve inlets and outlets (straight thru, bottom, 90 degrees left or right).

Then add a pressure regulator if you wish. Choose from a wide selection of automatic valve actuators . . . Solenoids, Hydranoids, Diaphragm Type either low voltage or millivoltage operation. All elements are independently removed, interchanged or added with only a screwdriver — an exclusive advantage for the installer or serviceman. Versatile VERSATROL — another design advance from GENERAL CONTROLS to make your work easier.

BE QUALITY SURE...ALWAYS SPECIFY GENERAL CONTROLS

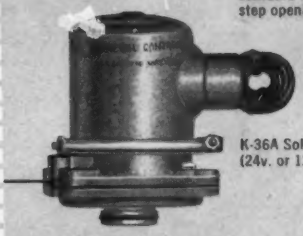
GENERAL CONTROLS

Automatic Controls for Product or Process

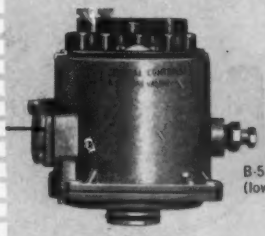
Glendale, Calif. • Skokie, Ill. • Guelph, Ontario, Canada

Nine Plants — 44 Factory Branch Offices Serving The United States Canada and Western Europe

K-36H Hydranoid (Silent, silicone cushion with standard or step opening).

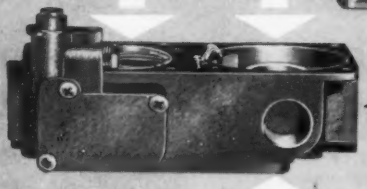


K-36A Solenoid (24v. or 120v.)



B-56 Diaphragm (low voltage)

B-66 Diaphragm (Millivoltage)

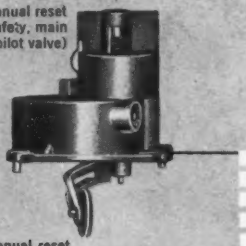


BASIC

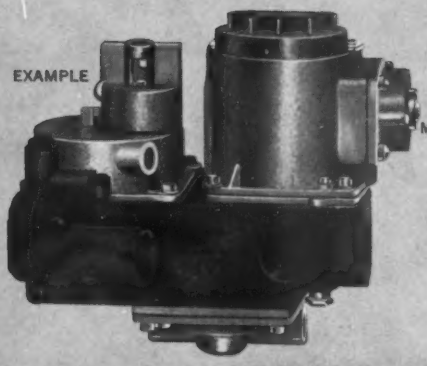
V305B Regulator (Single seat)

V305C Regulator ("Hi-Flo" Type)

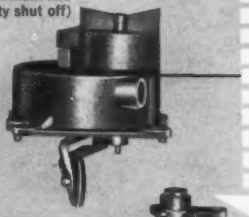
MR-50 (Manual reset valve—100% safety, main gas cock, pilot valve)



EXAMPLE



MR-80 (Manual reset with main line safety shut off)

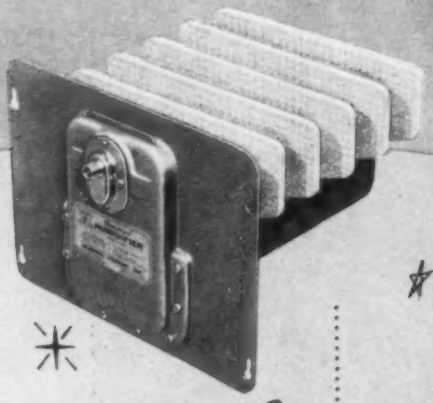


VERSATILE
VERSATROL

SCENE STEALERS

on the PROFIT STAGE of BUSINESS

• It's the *added* profit, the *increased* dollar volume that makes your business prosperous—that makes life worth living! General Filters products can help you—in a BIG way! Every heating plant service call you make is an opportunity to either *install* new units or *renew* efficiency with General Filters products. When you look at your sparkling monthly profits column you will find GF products are the best scene stealers you have ever seen. They give a stellar performance every time—*all* the time!



General FILTER

- Lifetime cast iron and steel construction protected with rust resistant plastic coating.
- Wool felt cartridges (replaceable) —trap moisture, dirt, lint; prevent nozzle clogging, gumming.
- Wool felt element cleaned and bonded to center mesh core.
- Two sizes fit all plants—

General "Moisture-Matic" 800 HUMIDIFIER

- Lifetime neoprene diaphragm.
- No float to stick, clog, or rust.
- Corrosion-proof molded pan.
- Chrome-plated valve.
- Holds up to 15 "Porous Weave" (replaceable) plates.
- 1 year guarantee on parts.
- Installs in 30 minutes (average time).

General's CLEAN RIGHT Soot Remover

- Saves up to 25% in heating costs in a single heating season!
- Works in every type heating plant—oil, coal, gas, wood.
- Fast acting! Consumes a ½" layer of soot in 2 to 5 minutes.
- Safe! No flash, no flare, no intense heat.
- Non-corrosive; won't harm burner parts!
- Light, powdery—can be sprayed or "spooned" into chambers and flues.
- Use on every call; sell to customers.

Member Humidifier Association

Ask Your Jobber for these **GF** Products

GF PRODUCTS **GENERAL FILTERS, Inc.** 43800 Grand River Avenue NOVI, MICHIGAN

IN CANADA: Canadian General Filters, Ltd., 39 Crockford Blvd., Scarborough, Ont.

WHAT'S HAPPENING...

(Continued from page 22)

Name GAMA Officers, Executive Committees

(Continued from page 22)

order of chairman, vice chairman and executive committee members who were appointed to serve for the year ahead by their respective divisions are as follows:

Gas Conversion Burner Div. — R. I. Warnecke, Roberts-Gordon Appliance Corp.; Joseph F. Capoun, Columbia Burner Co.; and Charles A. Reichelderfer, Nu-Way Corp.

Gas Furnace Div. — Gordon Rieley, Lennox Industries, Inc.; Samuel F. Shawhan, Bryant Mfg. Co.; and E. W. Gettinger, American Furnace Co.

Gas Unit Heater and Duct Furnace Div. — Clarence D. Scott, Sterlairco, Inc.; Harold P. Mueller Jr., Mueller Climatrol Div. of Worthington Corp.; and Cary Wilson, Modine Mfg. Co.

Gas Vent and Chimney Div. — J. R. Allen, Transite Pipe Div., Johns-Manville Sales Corp.; Jack Schmidt, Van-Packer Co. Div. of the Flintkote Co.; and Fay O. Suffron, Amerivent Div., American Metal Products Co., Inc.

Gas Water Heater Div. — D. W. Proulx, Rheem Mfg. Co.; D. Richard Whitney, Day and Night Mfg. Co.; and Harry Lasky, Pennsylvania-Bradford Appliance Co.

Heavy Duty Forced Air Heater Div. — M. Everett Barnard, Unit Heater Dept., Carrier Corp.; M. H. Stern, Industrial Heating Div., Lennox Industries, Inc.; and Charles E. Snyder, Machinery Div., Dravo Corp.

Automatic Controls Div. — Fred E. Weldon, General Controls Co.; R. A. Sherer, White-Rodgers Co.; Stephen L. Kile, Baso, Inc.; Frank H. Post, Robertshaw Thermostat Div., Robertshaw-Fulton Controls Co.; and C. M. Stainton, Controls Co. of America.

Burkhardt New OHI Managing Director

NEW YORK CITY—Charles H. Burkhardt has been appointed managing director of the Oil Heat Institute of America. Mr. Burkhardt will continue as secretary-treasurer of OHI and national secretary of the institute's distribution division.

Serving as a teacher for many years, Mr. Burkhardt taught such subjects as combustion, oil burners and oil heating. He has taught

Charles H. Burkhardt

on the vocational, technical and college levels, and lectured in many industry sponsored courses in a number of colleges and universities throughout the country. At one time he was director of field education for Perfex Corp. of Milwaukee. He is the author of several books, including "Domestic Oil Burners" and "Residential and Commercial Air Conditioning."

Gas Conversion Burner Sales Up

NEW YORK CITY — April shipments by manufacturers of gas conversion burners were 17.5 percent ahead of the April 1959 level, according to the Gas Appliance Manufacturers Association. The total for the first four months of 1960 was up 22.7 percent over the figure for the same period of 1959, according to GAMA.

NWAHACA Reports Progress Of Silver Shield

CLEVELAND—Reporting on the progress of the National Warm Air Heating and Air Conditioning Association's Silver Shield program, Randall A. Nelson, director of public relations, states that eight cities are now licensed to conduct Silver Shield programs: Kalamazoo, Lansing and Pontiac, Mich.; Niagara Falls, N.Y.; Philadelphia; Nashville, Tenn.; Sharon, Pa.; and Lima, Ohio.

Cities now organizing, training or preparing for operations are: Grand Rapids, Mich.; Camden, N.J.; Milwaukee; Buffalo; Cedar Rapids, Iowa; Tulsa, Okla.; Memphis; Mansfield, Ohio; Knoxville; and Portland, Ore.

Interest in Silver Shield design and installation courses is reflected by the number of persons—976—who have enrolled in such courses to date. Cities where

(Continued on page 27)

Traveling Clinic Diagnoses Heating System Troubles

MINEOLA, L.I., N.Y. — Homeowners and businessmen in Nassau and Suffolk Counties can now avail themselves of a free diagnostic and advisory service for warm air heating systems, according to the Climate Control Council. The council is composed of dealer-contractors in Nassau and Suffolk counties and members of Sheet Metal Workers Union Local No. 55.

Council investigators inspect the heating systems of persons seeking advice, diagnose problems and advise corrective measures.

(More news on page 27)

13 years of use-and-abuse prove there's no duct liner quite so rugged as ULTRALITE®

ULTRALITE Duct Liner is the *original* lightweight, low-density glass fiber liner made exclusively of long, strong textile-type glass fibers. Since it was introduced to the heating and air conditioning field in 1947:

It has been pulled, pinched, pummeled, gouged, compressed, kicked, sat upon, trampled, exposed to frigid and torrid temperatures, vibrated mercilessly, immersed in water and otherwise subjected to all the mechanical abuse that can arise out of shipment, storage, handling, and application.

But all this hasn't mattered, because ULTRALITE is the world's most rugged glass fiber duct liner. Come what may, it will not flake off into the air stream, shake off, settle, dent, pack down, rot, corrode, mildew, tear, dissolve, or otherwise lose its original insulating thickness and density. As the photos suggest, it is ① super-tough, ② pleasant to handle, ③ unaffected by water, ④ outstanding in thermal efficiency, and ⑤ unusually resilient, always springing back to its original thickness when compressed.

In addition to its ruggedness, ULTRALITE Duct Liner offers outstanding acoustical protection. And for all practical purposes, its air friction coefficient is the same as bare sheet metal!

All these extras cost you and your customers not a penny more. And for many of the same reasons that have made ULTRALITE *Duct Liner* industry's number one choice, you'll also want to try ULTRALITE *Duct Insulation*. The next time you need glass fiber duct liner or insulation, get the most for your money by calling your nearby ULTRALITE distributor.

FOR NAME OF YOUR NEAREST ULTRALITE DISTRIBUTOR, SEE ADJOINING COLUMN

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204 W. 10th St., Kansas City, Mo.

Thermal and acoustical glass fiber insulations . . . Molded glass fiber pipe insulation . . . Couplings and fittings for plain and grooved end pipe.

WHAT'S HAPPENING...

Gives Silver Shield Progress Report

(*Continued from page 25*)

schools are being conducted and the number of men enrolled are as follows:

Kalamazoo	35
Lansing	40
Rochester	20
Niagara Falls	35
Philadelphia	123
Camden	40
Nashville	30
Sharon	21
Lima	35
Pontiac	61
Grand Rapids	45
Milwaukee	100
Buffalo	110
Cedar Rapids	99
Tulsa	100
Memphis	60
Portland	22

Executives Study Aspects of Management

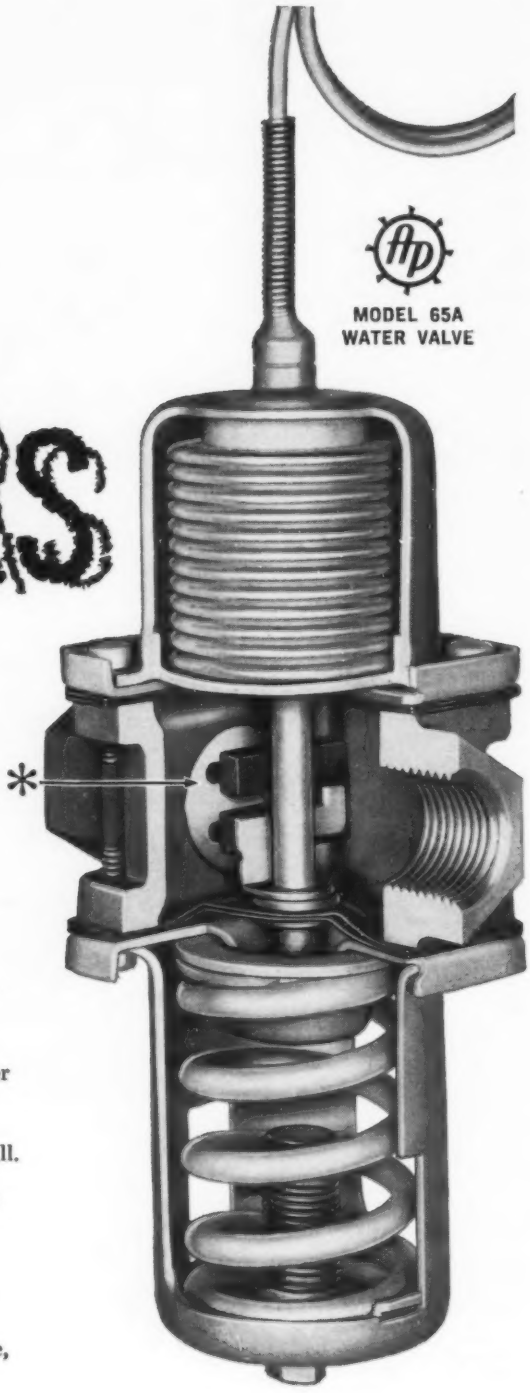
NEW YORK CITY—More than 1500 executives are expected to take part in the American Management Association's sixth annual summer program which began July 6 at Colgate University, Hamilton, N.Y., and will continue through August 31.

Selling More Gas For Cooling

SHREVEPORT, LA. — Evidence of growing use of gas for air conditioning is the shift in Arkansas Louisiana Gas Co.'s "summer valley on residential and commercial gas sales." According to the firm's 1959 annual report, as recently as 1954 this low point was reached in July and August. In 1959, the report points out, the low point had shifted to May.

NEW CONDENSER WATER REGULATING VALVE

NEVER CHATTERS



A-P MODEL 65A IS SMALL FOR EASY INSTALLATION . . .

*FEATURES SELF-CLEANING ORIFICE FOR RELIABLE OPERATION EVEN IN DIRTY WATER

The A-P model 65A eliminates chatter because it is not affected by inlet pressure variations . . . a unique design feature of the 65A valve in regulating water flow to condensing unit by head or condenser pressure.

The model 65A cleans itself as it operates. A Graphitar sliding block — the only moving part in water — wipes over the orifice in the stainless steel facing plate. Provides trouble-free service even in dirty water.

Compact size makes the A-P 65A quick and easy to install. Adjusting stem is completely accessible for easy manual adjustment — 65 to 300 psi. All moving valve parts operate as one unit. Gives quiet operation, increased bellows life. Low-friction Graphitar block won't wear out. Nylon-reinforced rubber diaphragm gives positive seal — provides flexibility for closing-opening action. Available in sizes ⅜", ½", ¾" female N.P.T.

Next time you install a condenser water regulating valve, install the industry's newest, quietest, pressure-actuated valve . . . the A-P model 65A.

Creative Controls for industry

CONTROLS COMPANY OF AMERICA

HEATING AND AIR CONDITIONING DIVISION

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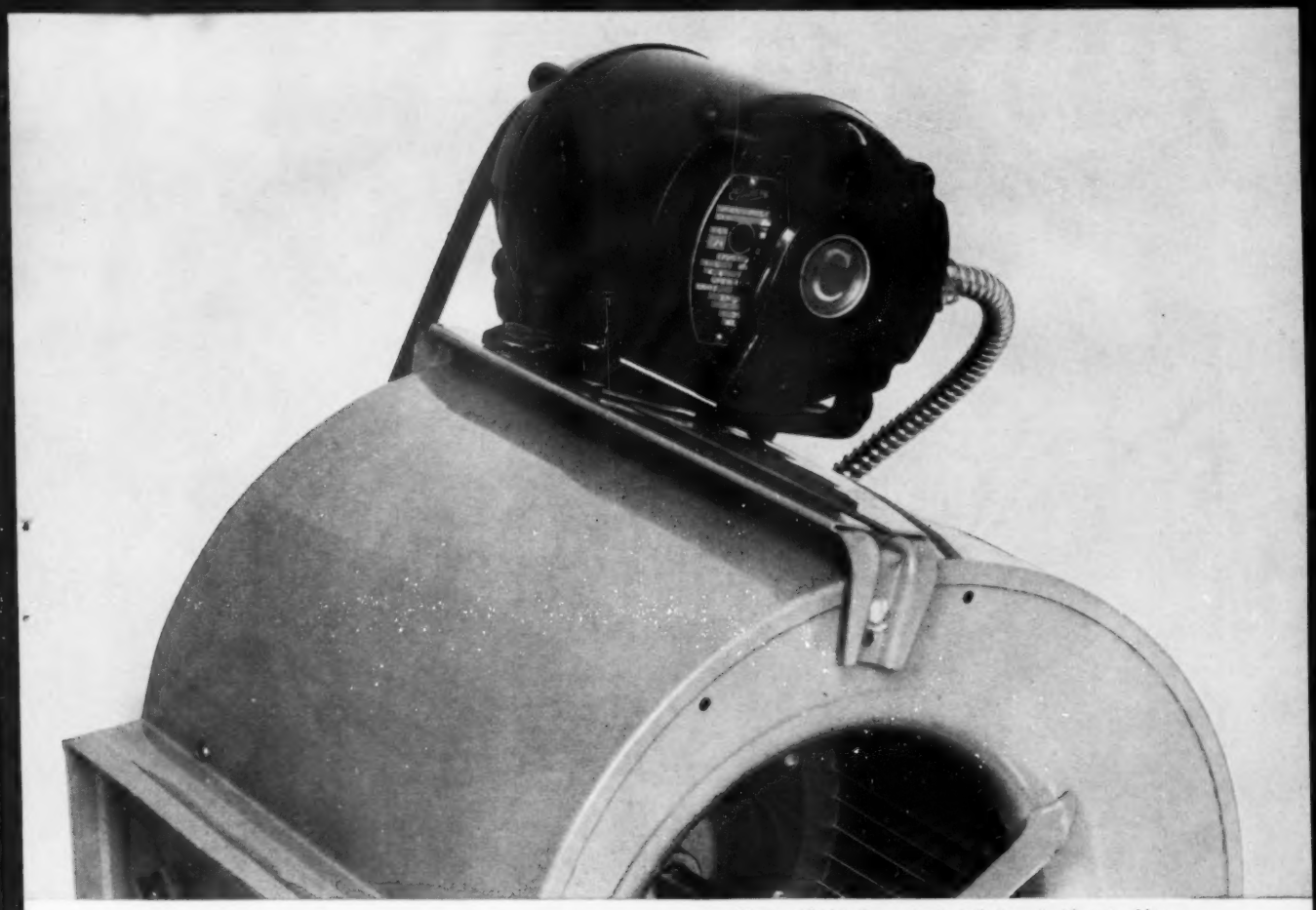
HAC-42-60



Century Electric fhp motor installed on double entry blower.

Why Century Electric motors give quiet, dependable service

Century Electric motors designed for the air conditioning and warm air heating industry help reduce costly service calls. Here are a few of the features that give quiet, dependable operation.

QUIET BECAUSE cushion base has resilient rings which keep motor from metallic contact with base. Result: reduced transmission of sound vibrations.

QUIET BECAUSE it has sleeve bearings. The shaft floats on a film of oil. You can pull the belt up without getting any bearing rumble.

QUIET BECAUSE rotor bars, end rings and fans are all integrally cast of aluminum. Rotor is dynamically balanced to assure extra smooth operation.

DEPENDABLE BECAUSE lubricating method is designed to withstand warm air furnace operating conditions.

DEPENDABLE BECAUSE insulation consists of bonded paper and "Mylar" slot cells and high temperature baking varnish. Result: high mechanical and dielectric strength.

DEPENDABLE BECAUSE of features like trouble-free governor; automatic thermal overload protection; positive grounding strip on cushion rings and pressure cast aluminum bearing brackets.

Also available: Two-speed motors for combination heating—air conditioning units; and 56-frame motors when half horsepower capacity and larger is required. For more information contact your nearest Century Electric Sales Office or Authorized Distributor.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century 59-20

the quality tells . . . the quality sells

new JANITROL

WIN-SUM-MATIC

year 'round air conditioner

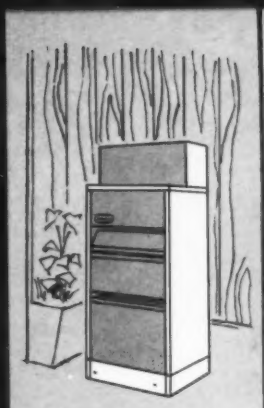
COMPACT . . .

Fits in as little as 3 3/5 square feet!
Features Dura-Tube Gas Heating Heart
and powerful air-cooled cooling.

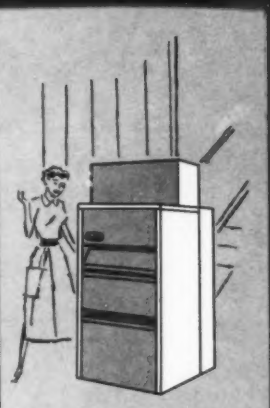
the Wraps are off...
and from this day on the new

Year-round air conditioner
is the one to sell and grow with!

New Janitrol Win-Sum-Matic with front panels removed to show compact design and complete accessibility from front.



WIN-SUM-MATIC
Model CVC-85
with bottom
filter cabinet.



WIN-SUM-MATIC
Model CVC-85
with back
filter cabinet.

feature-packed for a mighty Sales Punch!
WIN-SUM-MATIC by Janitrol

New, Slim "Look of the Future"! New crisp, clean, uncluttered rectangular design with flush front enhances built-in effect . . . saves valuable floor space. New warm-tone neutral colors with gold accent complement decor of any room—harmonize with other appliances.

New, Compact Cabinet. Height of Win-Sum-Matic CVC120-85 (Combination L) is only 6'-8" including outlet plenum. Width 22½", Depth 40". Easily installed in basements with 7' ceilings. Plenum has knockouts on both sides and front for horizontal take-off.

Complete Accessibility from Front. All internal parts are easily reached, simply by removing front panels. Snap-lock panel design. No screws.

Exclusive Season Selector Control. An internal air bypass damper, operated manually or by motor automatically with control by thermostat, provides correct air for heating or cooling without blower adjustments. Damper directs air over heat exchanger for heating, and directly from blower into outlet plenum and evaporator for cooling.

Exclusive, Powerful 52 Series CONDENSING UNIT

New, high performance design with larger condensing coil that boosts efficiency and economy. Safe, upflow exhaust...rugged, weatherproof construction . . . acoustically insulated.

Take the very finest in year 'round air conditioning equipment and make it *even better!* That's what Janitrol has done and this all-new Win-Sum-Matic is the proof.

Here in one compact "package" is surpassing new beauty with wonderful new refinement and elegance of line and color . . . "the look of the future".

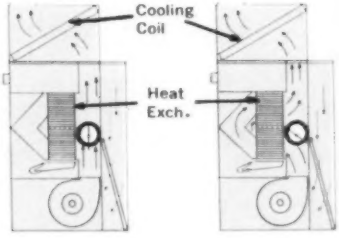
Here is new quietness of operation, with thrift that far exceeds accepted standards . . . a whole new concept of efficiency and dependability in performance.

Here is new ease and convenience in installation . . . new flexibility in the wide range of blower and motor combinations . . . new freedom of service and adjustment accessibility. Here, in fact, is everything you need and more to get your share of the booming air conditioning market.

Take a few minutes now to look over the features and advantages only Win-Sum-Matic offers. Then, ask your Janitrol representative—or mail coupon—for full details on how you, too, can sell and grow with Janitrol!

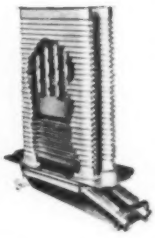
AIR FLOW DIAGRAMS
WIN-SUM-MATIC with Back Filter Cabinet

COOLING HEATING



SEASON SELECTOR (circled) allows straight-through air flow from blower to cooling coil for cooling . . . in winter, directs air through heat exchanger twice for maximum heat extraction.

Exclusive Dura-Tube Heating Heart



Warranted **20 years!** Born of the jet age! New A-19 armor coating, used to protect aircraft engine parts from corrosive, ravaging hot exhaust gases, is fused into all internal and external surfaces and joints—assures permanent sealing, new freedom from corrosion and burn-out. Twin-pass air flow design gives more heating capacity in less space, air passes over heat exchanger surfaces **twice**, resulting in higher heat absorption, true heating economy.

New Waterless Cooling Heart. Compressor-condenser needs only air and electricity, operates at lowest cost. Eliminates water supply and sewage requirements. Reduces service problems. Provides cooling with outside temperatures to 125° F.

New Quietness in Operation. Acoustically treated blower chamber, cushion mounted blower and blower motor, full-floating heat exchanger and air-cooled side panels provide a new concept quiet, smooth performance without annoying vibration or expansion-contraction noises.

Wide Range of Blower and Motor Combinations. Special, new blowers with alternate motors for each size of unit to furnish air deliveries for different cooling capacities in each model—greater installation flexibility.

Sizes to Heat and Cool Any Home. Models with heating input 80,000 to 200,000 Btu. Cooling output 22,000 to 76,000 Btu. AGA approved for natural, mixed or LP gas. (Ask about special approvals for commercial applications.)

Call WESTERN UNION Now!

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HARRY C. GURNEY, General Sales Manager
Janitrol Heating and Air Conditioning
A Division of Midland-Ross Corporation
Columbus 16, Ohio (In Canada: Wire Moffat's Ltd, Toronto 15)

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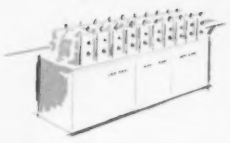
You'll do better by far as a ..

JANITROL® SELECT DEALER

WIRE COLLECT NOW
for proof . . . and a preview of the profitable future that's yours to enjoy!

For a better method of forming metal up to 12 gauge*...

DO IT FASTER, WITH LESS HANDLING, MORE OPERATIONS IN A SINGLE PASS!...



WITH

MAPLEWOOD ROLL FORMING MACHINES

ROLL-FORMING PANELS

LOCK-FORMING AND CUT-OFF

ROLL-FORMING

SPECIAL SHAPES

MAPLEWOOD GIVES YOU THESE BONUS FEATURES:

Variable Speed Drive with forming speed up to 200 fpm.

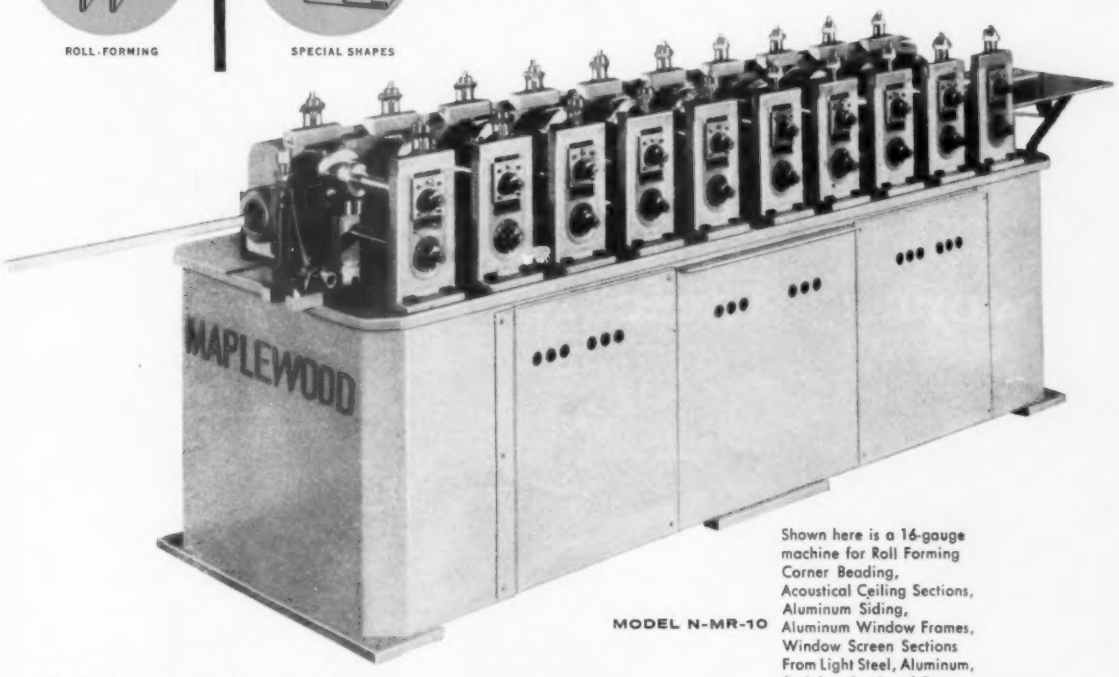
Adjustable Roll Center Distance from 4" to 5".

Sheet Metal Capacity Up To 72" wide.

SEE MAPLEWOOD ENGINEERS

for High-Speed Low-Cost Roll Forming Methods on Your Metal Sections.

Heavier Gauges Quoted On Request



MODEL N-MR-10

Shown here is a 16-gauge machine for Roll Forming Corner Beading, Acoustical Ceiling Sections, Aluminum Siding, Aluminum Window Frames, Window Screen Sections From Light Steel, Aluminum, Stainless Steel and Brass.

MAPLEWOOD

RMF

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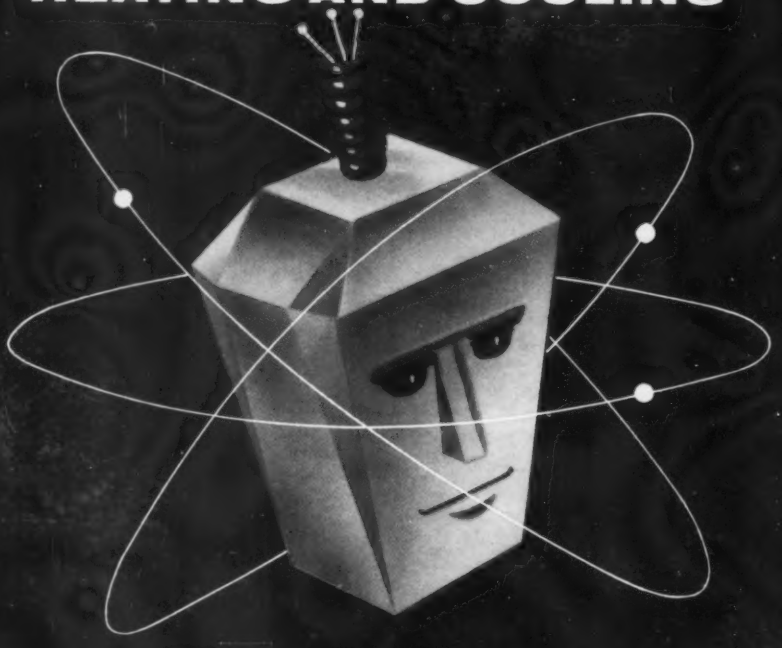
DIVISION OF ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET ROCKFORD, ILL.

COMPLETE LINE OF ROLL FORMING, CUT-OFF MACHINERY

WILLIAMSON

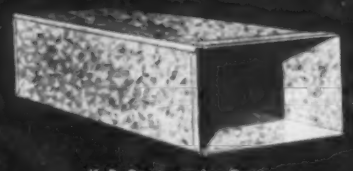
"Magic Brain"

HEATING AND COOLING



....works "Magic" for your sales!

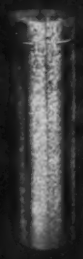
*Seal-Tite** DUCT, PIPE & FITTINGS



K. D. Rectangular Duct

Adjustable Elbow

Top Take-Off



Snap-Lock Round Pipe

AIR

Space Console Unit

THE INDUSTRY'S MOST COMPLETE LINE and THE INDUSTRY'S MOST UNIQUE SYMBOL

will help you make more heating and cooling sales

WARM AIR FURNACES . . . to fit any price range for the home owner or the builder.

AIR CONDITIONING UNITS . . . to fit practically any residential or light commercial need.

*Seal-Tite** **DUCT, PIPE AND FITTINGS** . . . to assure complete "magic comfort" with "Magic Brain" equipment!

NATIONALLY ADVERTISED to home owners and builders. Complete assortment of free literature, brochures, sales aids and tested selling plans.

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AMERICA'S HOMES

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Rush me information on your "MAGIC BRAIN" line of:
____Heating Equipment ____Cooling Equipment
____"Seal-Tite" Duct, Pipe & Fittings

Name_____Title_____

Firm_____

Address_____

City_____Zone____State_____

For duct work like this ...or for any job of yours

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WIDEST SELECTION. Choose from the nation's largest, most diversified stocks of steel, aluminum and industrial plastics.

TOP TECHNICAL HELP. Your Ryerson representative gives you unbiased recommendations—helps you select the best material for each job.

DEPENDABLE DELIVERY. Fast shipment on all your requirements—finest care in handling and packaging. Any quantity—when you need it.

METAL-FABRICATING MACHINERY. Hundreds of types and models of machinery produced by leading manufacturers for every kind of sheet metal shop operation.

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How to Sell Easier, Better and Longer

Mid-July often is said to be the end of the dealer-contractor's summer air conditioning selling season. It's felt that prospects who have failed to purchase by this time will figure that if they've gone this far through the summer without using air conditioning in their homes, they can finish the summer without having to reach a decision.

But many prospects have not reached a decision to buy air conditioning simply because they feel their inadequacy as a purchaser. They don't know how to buy summer air conditioning, and, as is typical of most people, they don't want to admit this inadequacy to anyone — including themselves.

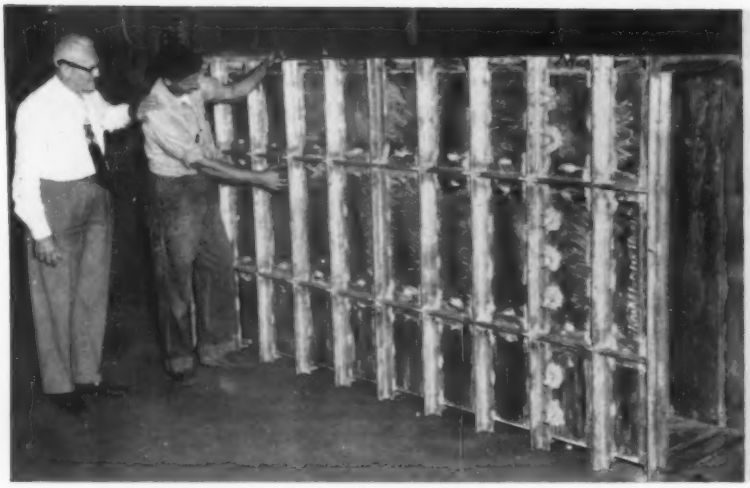
This buyer procrastination (or hesitancy) can and is being countered by many dealer-contractors all over the country. These dealer-contractors are using the Standards for Rating Residential Cooling Systems which were published and explained in the April American Artisan. Orders for copies of the Standards have been coming in at a fast pace. And what we hear from those who are using them is gratifying because we know that both buyers and sellers of summer air conditioning are benefitting.

With the Standards, a dealer-contractor is able to put his prospect at ease because the card explains in easy-to-understand language the essential points a prospect needs to understand about the purchase he is contemplating. The Standards provide a basis for discussion between the parties involved in a sale, and discourage doubt because the conditions that are acceptable and those that are undesirable are spelled out. The Standards qualify the higher prices asked by competent dealer-contractors.

Thus, the Standards make selling (and buying) easier and result in better jobs being installed. There is an additional value of the Standards — they represent a sales tool that can be used at any time of the year.

A prospect for a new heating system for his existing home, or a prospect planning a new home, should have the advantages of a complete year 'round comfort system explained to him. When heating is the primary interest, the Standards for Rating Heating Systems (July 1957 American Artisan) have proved to be a most effective sales tool. When these heating standards are used, it's an easy matter to introduce the cooling Standards and to swing the conversation to year 'round comfort.

The two Standards complement each other and make ideal sales tools for selling year 'round comfort at any time of the year.



SECTION of 12 ga duct reinforced with 2 x 2 x ¼ in. dipped galvanized angle iron for installation in concrete ceiling is inspected by A. F. Richter (left) and Harry Eggers, who fabricated the duct

Heavy Duty Ducts Used as Cable Conduits

Fabricating special equipment for electrical applications and other jobs made of sheet metal is an old and profitable service for this firm

WHEN SOMETHING SPECIAL has to be fabricated of sheet metal, Acme Heating and Ventilating Corp., St. Louis, frequently gets the job. "You never know what a customer will ask for next, but if it's of sheet metal, we are always ready to build it for him," says A.F. Richter, Acme Heating & Ventilating, St. Louis. This is the way Mr. Richter explains many of the special jobs his company handles each year.

Recently an electric utility company asked for a ventilated cable conduit to handle the heavy duty cables from one of its new generators. The ventilated cable conduit was needed because electric cables handling heavy loads tend to radiate large quantities of heat which must be removed to maintain electric line power efficiencies.

BLUEPRINT for rectangular elbow is reviewed by Robert R. Richter (left) and his father, A. F. Richter

This job was turned over to Robert Richter, son of A.F. Richter, who used his engineering background to lay out the work for this job. He also supervised the fabrication and installation.

The cable conduit (or duct) was required to pass through a 10 ft 6 in. concrete ceiling located above the generator. The duct was fabricated from 12 gage galvanized material. It was reinforced with 2 × 2 × ¼ in. angle iron that was welded on 12 in. centers longitudinally along the duct with maximum width of intermediate angle iron supports based on 24 in. centers.

This extensive support for the duct was installed to prevent the concrete from collapsing the duct at the time it was poured.

Duct sections 22 × 56 in. were kept to 4 ft. lengths and joined by bolting the angle iron collars together.

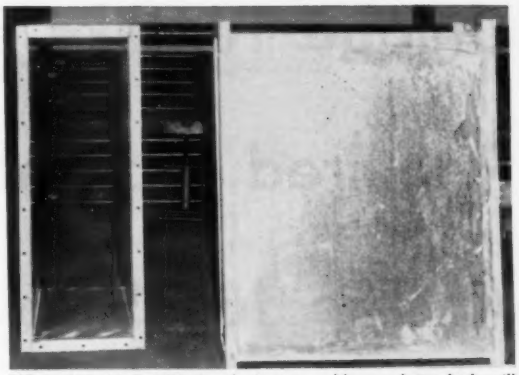
The ventilated cable conduit began near the floor of the generator room, rose to near the ceiling, made a 90 deg. bend into a straight horizontal section for 4 ft, then made another 90 deg. bend where it

passed through the 10 ft 6 in. concrete ceiling.

Electric cables using the duct as a conduit entered the duct from each side near its point of origin in the generator room. The cables then passed through the conduit to the floor above where they again passed through the side of the duct on their way to the equipment required for power distribution.

Air intake for the duct system was near the floor of the generator room where it passed through eight permanent type cleanable air filters (20 × 20 × 2 in.). Air flowing through the duct was handled by a standard exhaust system connected where it emerged from the 10 ft 6 in. concrete floor. The used air was discharged to the outside of the building.

In fabricating the duct system, the 90 deg elbows were made from 12 gage material as was the rest of the duct. Each contained two turning vanes installed on a 22 ½ in. radius. Turning vanes were made of 12 gage galvanized material and welded to the side of the duct. This was to prevent the electric cables from piling up and restricting the air-flow at the turns in the duct.



SIDE AND END VIEWS of electric cable conduit which will be ventilated to prevent excessive temperature created by high electric power demands on cable passing through the conduit

Equipment for Electrical Application

Fabricating special equipment for electrical applications is an old service for Acme Heating and Ventilating Corp. When a large St. Louis electrical contractor got the job of installing the electrical equipment for a processing plant's electrolytic tinning operation, Acme was called upon to fabricate out of 10 gage galvanized sheet the 19 massive and intricate pull and junction boxes that were required.

These boxes ranged from 16 × 18 × 18 in. to 9 × 3 × 2 ft. They required from 4 to 50 knockouts and many of them required angle iron frames, stands, and some had special hubs welded in them.

Acme plant engineer, Harrison Eggers directed the layout and fabrication of these boxes. He designed and made a special die for the press brake, and also made several special jigs and fixtures that facilitated the assemblies.

Fabricating Metallized Letters

Another special job recently handled for a customer was fabricating metallized letters for a company name to be located on the roof of its main building.

The letters were fabricated from 18 gage black iron that was sand blasted then coated with a galvanized paint grip. The letters were then sent to a local company that specializes in metallizing so that when the job was completed the letters had the appearance of stone to match the architectural design of the building.

These letters were first laid out by Acme engineer W. J. Hempel on drawing paper, then enlarged to fit the actual dimensions of the letters. This was used as a pattern for cutting out the sheet metal.

Standard shop tools were used to shape the various letters and to provide the support and rigidity needed for letters exposed to the elements. The letters, when completed, were fastened securely into a base plate attached to the roof. No back support was needed for the letters.

Satisfied customers are their best salesmen, according to Mr. Richter, and account for many "special" jobs that are fabricated by Acme Heating and Ventilating Corp.

TURNING VANE in duct elbow designed to prevent electric cable packing is examined by Robert R. Richter (left) and James A. McCully, secretary of the company

Unique Tentlike Sheet Metal Roof Required Fabricating Panels At The Job Site

Because no two panels were the same, every panel had to be cut at the job site, checked, trimmed, shaped and installed before the next panel could be worked on

TERNE METAL ROOF provides permanent protection for the retired circus performer who built his house to resemble the Big Top to which he was accustomed

YEARS SPENT with the circus, living and performing in tents of all kinds, had its effect on an aging performer who wanted to build a permanent home in Sarasota, Fla. In deciding upon the design for his home, the performer selected one that resembled a Big Top with a circular lean-to attached. Further tentlike appearance was achieved by using 2½ in. black pipes that were spaced vertically around the house to support the roof and give the effect of side tent poles.

Roof Creates Problems

The general contractor had little difficulty building the circular walls for the attached lean-to, but the sheet metal contractor who installed the roof had his hands full.

Specifications called for 40 lb terne metal roofing with diagonal batten vertical seams coming together at the peak. Horizontal seams were flat locked. Under normal circumstances, it would not have been a difficult job but the roof had the general appearance of a half egg shell that had been sliced the long way.

Each Panel Tailored

"No two panels were the same," was the way Ralph Hutchens, Superior Sheet Metal Products, Sarasota, put it. The roof used 2 X 2 in. steel rafters, covered with plywood for the base. Two-inch wooden battens were fastened to the plywood base. The battens began at the top and sloped to the imitation side tent poles.

Due to the location of the poles and their relation to the off-center peak, each sheet metal panel was of a different shape and size, preventing precutting and fabricating at the shop. Every panel was cut at the job site, checked, trimmed, shaped and installed before the next panel could be worked on.

Tent Pole Peak

Further duplication of the Big Top was achieved by use of a circular chimney to resemble the main tent pole. A 4 ft circular plastic skylight duplicated the main pole cap and served to admit daylight into the stairwell of the house.

Panels that ended at the roof peak were flashed to a steel ring that acted as top support for the chimney and skylight frame.

HUGH REID'S SHEET METAL PATTERN

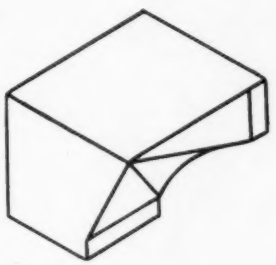
How to Develop:

A Square Back 90 Deg Transition Elbow

This elbow is commonly used as a bonnet fitting on the warm air supply side of the furnace. The square back adds extra volume to meet plenum chamber requirements

Can you develop this pattern in 45 minutes?

Here's a new and accurate approach to the development of sheet metal patterns that will cut costly layout time. The method applied to this month's fitting can be used as a guide to develop related patterns and solve other problems encountered at the layout bench



THE SQUARE BACK 90 deg transition elbow selected for this month's pattern problem is commonly used as a bonnet fitting on the warm air supply side of the furnace. The square back adds extra volume to plenum chamber requirements.

In the simplified method, it is necessary to layout the straight side first. This must be followed by the back and throat patterns. From these three layouts, the true length lines are developed for transfer to the offside pattern. Any deviation from this procedure will result in added time for the pattern layout.

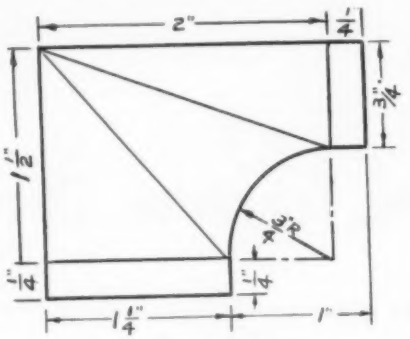
By following the simplified method as outlined on the drawing and written material, the time required to lay out the patterns for an average size fitting of this type should not exceed 45 minutes.

Given the front view (Fig. 1) and the end view (Fig. 2) of a square back 90 deg transition elbow, the following is a step-by-step analysis to the pattern problem solution.

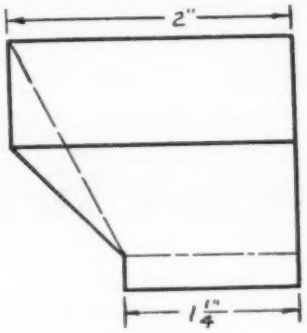
Straight Side Pattern, Fig. 3—

a) Draw a 1¼ in. horizontal line. Mark its terminals as points M and L. From both points draw lines perpendicular to and above this line. From

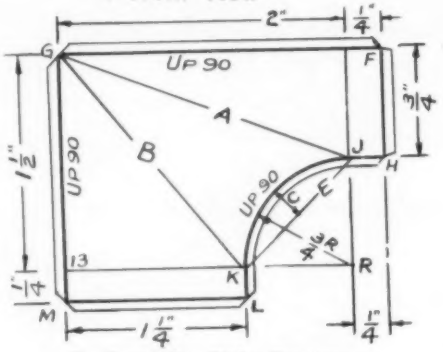
NOTE: THESE PATTERN dimensions should be multiplied by the predetermined ratio figure to produce the actual size of the fitting needed



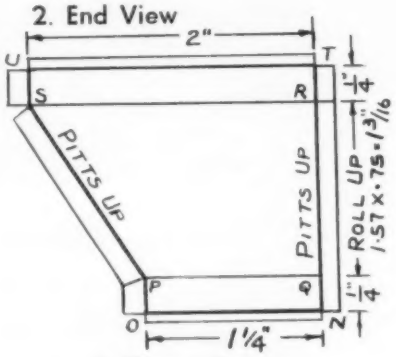
1. Front View



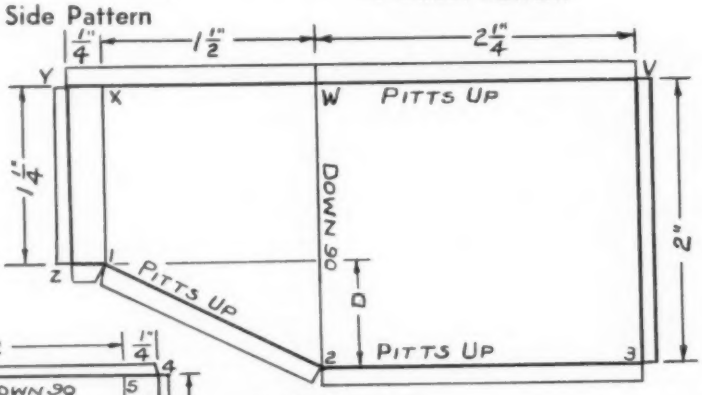
2. End View



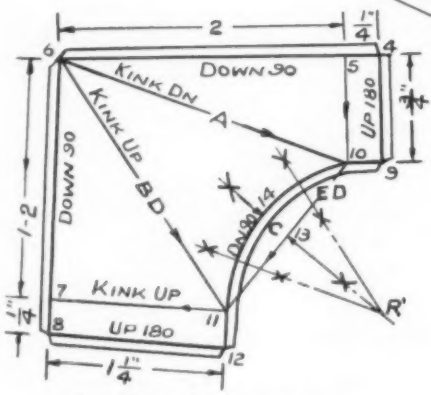
3. Straight Side Pattern



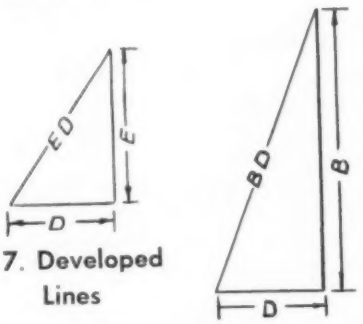
4. Throat Pattern



5. Back Pattern



6. Offset Side Pattern



7. Developed Lines

After laying out the straight side, then the back and throat patterns, the true length lines are developed for transfer to the offside pattern

point M measure 1/4 in. up the vertical line and locate point 13. Above point 13, measure 1 1/2 in. and locate point G. Measure up 1/4 in. above point L and locate point K. Draw the line 13-K.

b) From point G, draw a line perpendicular and to the right of line M-G. Measure 2 1/4 in. on this line to locate point F. From point F, draw a line downward and perpendicular to line G-F. Measure 3/4 in. down this line to locate point H.

c) Extend the line 13-K to the right of point K. Measure 3/4 in. on this extended line to locate point R. With point R as center and radius 3/4 in., draw a 90 deg arc above point K. Mark the termination of the arc as point J. Draw lines from points L and H tangent to the arc.

d) Draw a line connecting point G and J and mark it as line A. Draw a line from point G to point K and mark it as line B. Draw a line connecting points K and J and mark it as line E. Bisect line E and through the bisection draw a line connecting arc K-J and line E. Mark this as line C.

Throat Pattern, Fig. 4—

a) Draw a 1 1/4 in. horizontal line and mark the extremity points as O and N. From points O and N draw lines perpendicular to line O-N.

b) Calculate the length of the 90 deg arc K-J (Fig. 3) by multiplying the given 3/4 in. radius by the constant 1.57. Thus 1.57 × 0.75 equals 1 3/16 inches. Transfer from Fig. 3 the 1/4 in. straight length L-K, the 1 3/16 in. arc length K-J, and the 1/4 in. straight length J-H to the perpendicular line drawn above point N (Fig. 4). Mark the points as Q, R and T.

c) From points Q, R and T, draw lines to the left and perpendicular to line N-T. Measure 1 1/4 in. to the left of point Q and mark the point as P. Measure 2 in. to the left of points R and T and mark the points as U and S. Draw the lines U-S, S-P and P-O.

Back Pattern, Fig. 5—

a) Draw a horizontal line and mark the left extremity point as Y. Working from Fig. 3, transfer the given lengths 1/4 in. (M-13), 1 1/2 in. (13-G) and 2 1/4 in. (G-F) to the right of point Y and mark the points as X, W and V.

b) From points Y, X, W and V, draw lines downward and perpendicular to line Y-V. From points Y and X, measure the given 1 1/4 in. as shown on the end view (Fig. 2) and mark the points as Z and 1.

c) From points W and V measure down the given 2 in. length as shown on the end view (Fig. 2) and mark the points as 2 and 3. Draw the lines Z-1, 1-2 and 2-3. Draw a line from point 1 perpendicular to line X-1 to extend to the right of line W-2. Mark the distance between the extended line and line 2-3 as distance D.

Offset Side Pattern, Fig. 6—

a) Draw a horizontal line and mark the left extremity as point 6. From this point, measure to the right the given 2 in. and 1/4 in. as shown on the front view (Fig. 1) and mark the points as 5 and 4. From points 5 and 4 draw lines below and perpendicular to line 6-4. Measure 3/4 in. on both lines and mark the points as 10 and 9.

b) Draw a line connecting points 6 and 10. Mark it as distance A. Draw a right angle (Fig. 7), and from Fig. 3 transfer the line marked B to the vertical leg and the distance marked D from Fig. 5 to the horizontal leg of the right angle. The hypotenuse line B-D is the developed line. With point 6 (Fig. 6) as center and radius B-D, draw an arc below and to the left of point 10.

c) Draw a second right angle. Transfer the line marked E from Fig. 3 to the vertical leg of the right angle and the distance marked D from Fig. 5 to the horizontal leg. The hypotenuse line E-D is the developed line. With point 10 (Fig. 6) as center and radius E-D, cut arc B-D and mark the intersection as point 11.

d) With point 11 (Fig. 6) as center and radius 1 1/4 in. (Fig. 1), draw an arc to the left of point 11. Set a compass at line length 1-2 (Fig. 5) and with point 6 (Fig. 6) as center, cut the arc drawn from points 11, 14 and 10.

e) Draw a line connecting points 10 and 11. Bisect this line and through the bisection draw a line. Label the intersection of the bisection line and line 10-11 with the number 13. Set a compass as line length C (Fig. 3) and with point 13 (Fig. 6) as center, transfer this length to the bisection line and mark it as point 14. Bisect the space between points 11 and 14, and also between points 10 and 14. Draw lines through the bisection points to the right until they join. Mark this joint as point R′. With R′ as center, transfer this length to the bisection line and points 11, 14 and 10.

f) From points 7 and 11 draw 1/4 in. below and perpendicular to line 7-11. Measure down 1/4 in. and locate points 8 and 12. Draw line 8-12.

Add allowances for seams and joints and mark the patterns for fabrication.

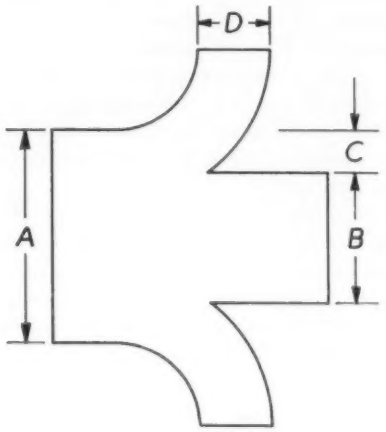
Ductwork Tables Establish Fabrication Costs

. . . when used to estimate weight and time required for complete low velocity air distribution systems

SOMEWHERE IN THE PROCESS of converting any given set of engineering plans into a finished and operating central air conditioning system, the sheet metal contractor must face the problem of estimating the weight of galvanized sheet metal and the amount of labor required to fabricate the ductwork ready for hanging. This fabricating cost, added to the cost of labor required for erection,

Rectangular Reduction Joint

With 2 Branches Opposite



Time and weight shown here is to be added to that given for a Reduction Joint with One Branch as tabulated on preceding pages.

Depth of duct		7 in.		8 in.		9 in.		10 in.		12 in.	
Dimension		Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time
D	C										
16	12	11.0	30	11.3	30						
14	10	9.0	30	9.4	30	10.5	30				
12	9					9.2	30				
12	8	7.3	30	7.5	30			9.7	30		
12	7							9.0	30		
10	7	6.3	30	6.6	30	7.4	30				
10	6							7.3	30	8.4	30
9	6	5.8	30	6.1	30	6.5	30				
9	5							6.3	30	7.8	30
8	5	5.5	30	5.6	30	5.8	30				
8	4							5.8	30	7.0	30
7	4	5.0	30	5.3	30	5.5	30	5.6	30	6.3	30
6	4	5.0	30	5.3	30	5.5	30				
6	3							5.4	30	6.0	30
5	3	4.7	30	5.0	30	5.1	30				
5	2							5.0	30	5.7	30
4	2	4.4	30	4.7	30	4.9	30	5.0	30	5.5	30
3	1									5.5	30

Weight given in pounds **Time shown in minutes**

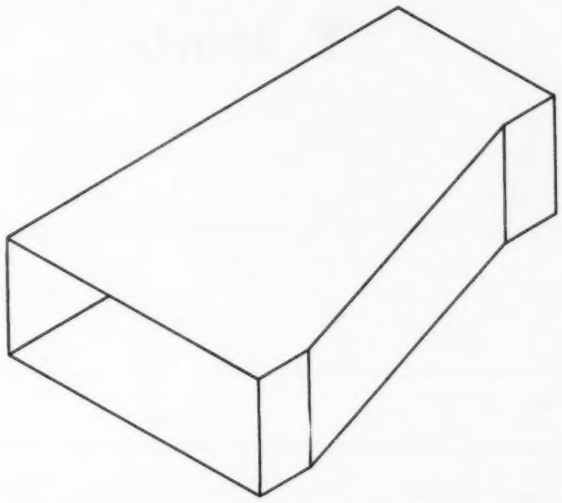
represents the net cost of the metal work to which must be added overhead and all other expenses, plus profit, to arrive at the selling price of the metal work connected with the installation.

The tables published on this and following pages are part of a set of ductwork estimating tables that were reviewed and revised in 1959 to represent current practices in modern sheet metal shops. The revision was handled by Darwin A. Downing, Head Apprentice Teacher, Sheet Metal Apprentice Training School, Detroit. After revision, the tables were reviewed by E. B. Root, now a consulting engineer in Birmingham, Mich. who prepared the original set of ductwork estimating tables that were published in 1947.

Other tables in this series have been published by American Artisan each month since April 1960. Additional tables are scheduled for future issues. Upon completion of the series, a sample problem will be worked out in detail.

Rectangular Reducing Joints

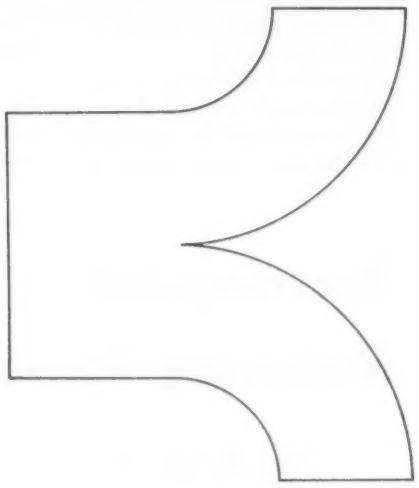
No Branch



Depth of duct	7 in.		8 in.		9 in.		10 in.		12 in.	
Width of large end	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time
44	20.8	25	21.2	25	21.8	25	22.0	25	22.7	25
42	20.0	25	20.4	25	20.9	25	21.2	25	22.0	25
40	19.3	25	19.6	25	20.1	25	20.4	25	21.2	25
38	18.5	25	18.9	25	19.3	25	19.7	25	20.4	25
36	17.7	25	18.1	25	18.5	25	18.9	25	19.7	25
34	16.9	25	17.3	25	17.7	25	18.1	25	18.9	25
32	16.1	25	16.5	25	16.9	25	17.3	25	18.1	25
30	12.1	25	12.4	25	12.7	25	13.0	25	13.6	25
28	11.5	25	11.8	25	12.1	25	12.4	25	13.0	25
26	10.9	25	11.2	25	11.5	25	11.8	25	12.4	25
24	10.3	25	10.6	25	10.9	25	11.2	25	11.8	25
22	9.7	25	10.0	25	10.3	25	10.6	25	11.2	25
20	9.1	25	9.4	25	9.7	25	10.0	25	10.6	25
18	8.5	25	8.8	25	9.1	25	9.4	25	10.0	25
16	7.9	25	8.2	25	8.5	25	8.8	25	9.4	25
14	7.2	25	7.6	25	7.9	25	8.2	25	8.8	25
12	6.6	25	7.0	25	7.3	25	7.6	25	8.2	25
10	6.0	25	6.4	25	6.6	25	6.9	25	7.6	25
9	5.7	20	6.1	20	6.3	20	6.6	20	7.2	20
8	5.4	20	5.8	20	6.0	20	6.3	20	6.9	20
7	5.1	20	5.5	20	5.7	20	6.0	20	6.6	20
6	4.8	20	5.2	20	5.4	20	5.7	20	6.3	20

Weight given in pounds **Time shown in minutes**

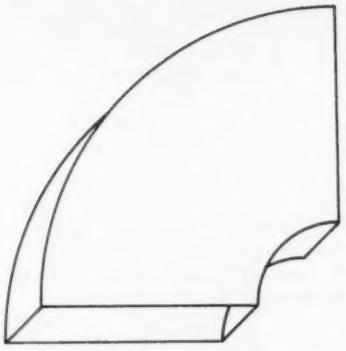
Y Joints



Depth of duct	7 in.		8 in.		9 in.		10 in.		12 in.	
Width of duct	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time
44	57.9	120	59.0	120	60.2	120	61.3	120	63.6	120
42	54.0	110	55.1	110	56.2	110	57.3	110	59.5	110
40	50.1	100	51.1	100	52.2	100	53.3	100	55.4	100
38	46.1	90	47.1	90	48.2	90	49.2	90	51.3	90
36	42.2	90	43.2	90	44.2	90	45.2	90	47.2	90
34	38.3	90	39.3	90	40.2	90	41.2	90	43.1	90
32	34.3	90	35.4	90	36.2	90	37.2	90	39.0	90
30	24.3	70	25.0	70	25.7	70	26.4	70	27.8	70
28	22.1	60	22.8	60	23.5	60	24.1	60	25.4	60
26	19.9	60	20.5	60	21.2	60	21.8	60	23.0	60
24	17.6	60	18.2	60	18.8	60	19.4	60	20.6	60
22	15.4	60	16.0	60	16.6	60	17.1	60	18.2	60
20	14.4	50	15.0	50	15.5	50	16.0	50	17.0	50
18	13.3	50	13.8	50	14.3	50	14.8	50	15.8	50
16	12.3	50	12.8	50	13.3	50	13.7	50	14.6	50
14	11.2	45	11.7	45	12.1	45	12.6	45	13.4	45
12	10.2	45	10.6	45	11.0	45	11.4	45	12.2	45
10	9.1	45	9.5	45	9.8	45	10.2	45	11.0	45
8	8.0	45	8.4	45	8.8	45	9.1	45	9.8	45

Weight given in pounds **Time shown in minutes**

Broadway Elbows



Depth of duct	7 in.		8 in.		9 in.		10 in.		12 in.	
Width of duct	Weight	Time	Weight	Time	Weight	Time	Weight	Time	Weight	Time
44	80.3	140	80.9	140	81.8	140	82.5	140	86.4	140
42	73.8	140	74.3	140	75.1	140	75.9	140	77.5	140
40	67.3	130	68.1	130	68.9	130	69.7	130	71.3	130
38	60.8	130	61.6	130	62.4	130	63.2	130	64.8	120
36	54.3	125	55.1	125	55.9	125	56.7	125	58.3	110
34	47.8	90	48.6	90	49.4	90	50.3	90	51.8	105
32	41.3	90	42.1	90	42.9	90	43.8	90	45.3	105
30	31.0	90	31.7	90	32.4	90	33.0	90	34.4	95
28	28.1	90	28.8	90	29.5	90	30.2	90	31.6	90
26	24.0	60	24.6	60	25.1	60	25.6	60	26.6	60
24	20.8	60	21.3	60	21.8	60	22.3	60	23.3	60
22	17.8	60	18.3	60	18.7	60	19.2	60	20.6	55
20	15.0	55	15.4	55	15.8	55	16.0	55	16.8	55
18	12.6	50	13.0	50	13.4	50	13.7	50	14.3	50
16	10.3	50	10.7	50	11.0	50	11.3	50	11.9	50
14	8.2	40	8.5	40	8.8	40	9.1	40	9.7	45
12	6.4	40	6.7	40	6.9	40	7.2	40	7.6	45
10	5.0	35	5.3	35	5.6	35	5.7	35	6.4	40
9	4.9	35	5.2	35	5.4	35	5.6	35	6.1	40
8	4.5	30	4.8	30	5.0	30	5.5	30	5.9	35
7	3.9	30	4.1	30	4.2	30	4.4	30	4.8	35
6	3.2	30	3.4	30	3.5	30	3.7	30	4.0	30
5	2.7	30	2.8	30	2.9	30	3.1	30	3.3	30
4	2.1	30	2.2	30	2.3	30	2.4	30	2.7	30

Weight given in pounds **Time shown in minutes**

Save These Pages

Each month additional pages will be published and upon completion of the entire set of 27 tables a sample probelm will be worked out in detail.

CONFERENCE on duct layout and equipment placement is a frequent event at Kalamazoo Heating and Appliance Co. E. J. French (standing) makes a suggestion to Harley A. Monk (left) and Max R. Dwillard

Careful Planning Pays Off In:

- **Repeat Business**
- **Comfortized Jobs**
- **Continued Growth**

Reputation of this firm to install any type of warm air heating and unitary summer air conditioning system in the residential and commercial field is founded on the principle of not installing "just a heating system," but a system designed to provide comfort under all conditions

"'PLANNING WITH CARE' is our watchword and it pays off in a variety of ways. Prompt attention paid to a customer's wishes is often reflected in our being recommended to handle a job that we might never have heard about otherwise. One recent installation of two furnaces in a church was the result of work we did for one of the church members. A year 'round air conditioning system for a large residence came to us because of similar work for a friend," says E. J. French, Kalamazoo Heating & Appliance Co., Kalamazoo, Mich.

"When we are asked to bid on a job that does not

follow the usual pattern, the plans are carefully studied at the office by myself, my partner M. R. Dwillard, and our sales engineer Harley A. Monk.

"After we have an opportunity to study the plans, a sales conference is held and each of us expresses his points of view. We just jot down all the best ideas expressed and then review them again before estimating and selecting the equipment to match the job requirements.

"This is our way of handling most of our jobs and it pays off in many excellent referrals."

Builds Reputation on Ability

This is the key to successful growth for the Kalamazoo Heating & Appliance Co. over a 41 year period. The reputation of the company is built upon its ability to make any type of warm air heating and unitary summer air conditioning system installation. This approach to serving customers both in the residential and commercial field has provided the company with a reputation for not installing "just a heating system," but a system designed to provide comfort under all conditions.

Heat Plus Moisture Equals Warmth

Mr. French states that there is a definite difference between heating a house and comfortizing a house.

He points out that heat alone is not enough — that a heating system should be designed to include adequate humidification equipment. This, he states, not only removes physical discomfort but provides the moisture needed for house furnishings. He believes that heat plus moisture equals *warmth*.

TWO FURNACES of equal capacity utilize common return and supply plenums and dual humidifiers to match temperature and moisture requirements of a small printing plant

FIFTEEN PERCENT larger supply ducts specified for year 'round air conditioning system is one of the four plus features included in this installation. The other three are humidifier, electrostatic air cleaner and flexible duct connections

Comfortizing a Ranch Style House

A recent job was a year 'round installation in a ranch style house in which several of the rooms in the basement were planned for frequent use. One was to be used as a game room, and the other as a recreation room which would include a television set and various small games. The game room would be used for larger games such as table tennis and a dart game.

This installation included a duct system designed for summer air conditioning requirements. It was adequately braced, supported, and separated from the mechanical equipment by flexible duct connections. Accessory equipment included a spray type humidifier and an electrostatic air cleaner. Summer cooling was provided by an air cooled condensing unit that was located outside and to the rear of the building, and a matching capacity cooling coil was placed above the furnace in the supply plenum.

Includes Plus Features

Some of the plus features of this installation included locating the condensing unit on a concrete slab separated from the building foundation (to pre-

The extras included in recommendations help this dealer-contractor to sell his systems even when lower bids have been submitted by competitors

vent noise transmission to the building frame), and positioned so it would blend with landscaping without interfering with air flow to and from the condensing unit.

Another feature was imbedding the condensate drain from the cooling coil that was located in the furnace plenum, in the concrete floor prior to pouring the concrete. Copper tubing was used for the drain to avoid deterioration through the years. Another plus feature in this air conditioning system was connecting an outside air intake that could be adjusted to provide almost any quantity of outside air required for the system.

Ducts Sized for Proper Air Flow

The duct system, based on the requirements of the summer air conditioning system was found to be about 15 percent larger than that required for the heating system. Ducts were sized to provide the proper air flow and thus reduce the possibility of excessive discharge velocities that might cause objectionable noise.

Perimeter air distribution was used throughout the living area on the first floor. Overhead ceiling diffusers were used for basement rooms.

Church Installation Required Special Handling

A heating and ventilating system was installed in a small church because of satisfactory service rendered in the past to a member of the congregation.

Two furnaces were required to heat this church which had the nave on the second floor level. The first floor contained Sunday school classrooms, an assembly hall, and kitchen.

Some of the plus features included in this installation were at the entrance to the vestibule on the second floor level. Where normally a diffuser would be located on each side of the entrance doors, a third diffuser was added in the small space between the two sets of doors. This, Mr. French points out, makes it possible to quickly temper any cold air entering the vestibule while the door is open.

REMOTE CONDENSING UNIT for summer air conditioning system of ranch style house is located under the eaves of the house for maximum protection from weather

CENTRAL RETURN GRILLE size is checked by E. J. French against specifications for new church social room

No Noticeable Drafts

Perimeter heating through floor diffusers spaced at short intervals under exposed wall areas made it possible to avoid drafts in the nave.

Also, return openings for the church are provided in four places under the pulpit.

This location of the return openings serve a dual purpose; 1) It prevents large quantities of air moving across the first rows of seats which would have been noticeable to occupants; and 2) It prevents any possibility of air noise due to high velocity at return grilles.

The lower floor used for Sunday school classes and social gatherings is heated by a perimeter system located in the slab floor. The return air is taken in at several central collecting points in order to prevent noticeable drafts at any one location. Another precaution taken in this installation was the use of separate outside air intakes for combustion purposes and for the ventilating system.

Easy to Operate Control System

A plus feature of the control system for each floor was the location of the thermostat and the ventilating switch. The ventilating switch operates the blower for continuous operation regardless of whether heating

is or is not required. When heat is required, the input is controlled by the thermostat setting.

The two controls are located adjacent to one another and make it easy for any member of the congregation opening the church to operate the equipment.

Two Furnace Installation

Another installation for commercial purposes included the use of two furnaces of equal capacity connected in parallel to handle the heating load of a small printing plant.

Each furnace is connected to a common plenum from which the air is supplied to the various rooms in the printing plant. The return duct is connected to a common plenum from which each furnace draws the air required by its blower when it is in operation. This system also includes two humidifiers, one is located directly above each furnace so the air being handled will contain the proper humidification required to assure ease of handling the paper stock used.

Advantages of Installation

Advantages of using two furnaces in parallel is the economy of fuel consumption and the maintenance of furnace efficiency on mild days when required output capacity is less.

The furnaces are controlled by two thermostats which can be adjusted individually by the management. These thermostats are sometimes adjusted for a 1 deg temperature difference. If the building temperature drops 1 deg below the thermostat adjusted for the higher temperature the second unit will supply sufficient heat to meet the needs of the building.

Customers Appreciate Extras

It's the extras that Kalamazoo Heating and Appliance Co. includes in their recommendations that help them to sell their systems even when lower bids have been submitted by competing companies.

"These extras," states Mr. French, "enable us to satisfy our customer needs and build a reputation for installing a heating system designed to provide comfort under all conditions.

"When studying the plans for a job, we know that heat alone is not enough. A heating system should be designed to include adequate humidification equipment that removes not only physical discomfort, but will provide the moisture needed for home furnishings.

"Our formula for providing the customer with a proper heating system is: heat plus moisture equals warmth."

FREQUENT USE of floor diffusers located along the perimeter of a church nave prevents any sensation of drafts by members of the congregation

OUTSIDE AIR OPENING used to provide combustion air to two 175,000 Btuh furnaces

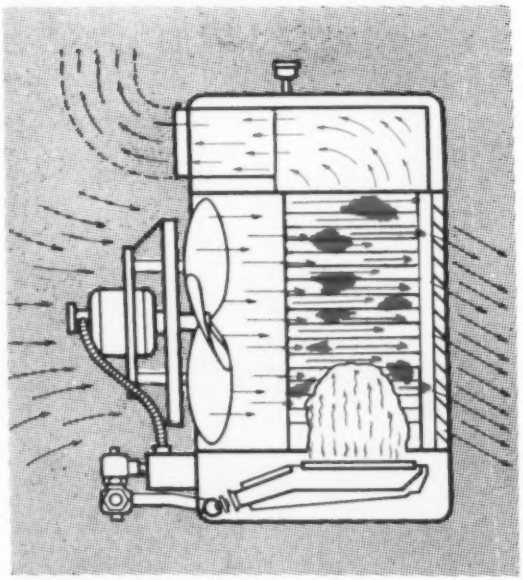
A PLUS FEATURE added to the heating system for a church is the floor register set between the two doors to assist the registers located on each side of the doors to temper admitted air when door is opened

HEATING with DIRECT-FIRED UNITS

Effect of Solvent Corrosion On Direct-Fired Heat Exchangers

General ventilation of the space where solvents are present is not a positive solution to prevent corrosion since unpredictable room air currents can carry damaging chlorinated solvent vapors into the combustion air

By L. W. Sutherland
Manager, Product Planning & Engineering
Janitrol Heating & Air Conditioning Div.
Midland-Ross Corp.

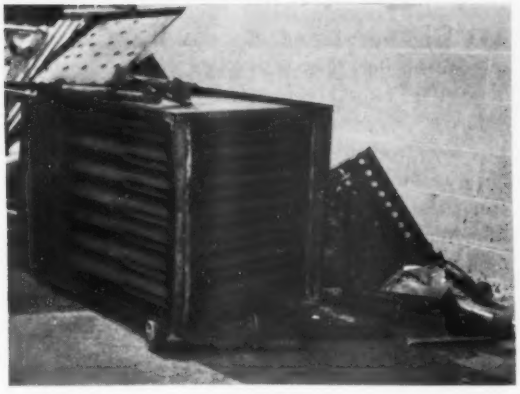


CORROSIVE ACTION caused by chlorinated solvents is not restricted to the burning of any one type of fuel

LOCATING correctly sized direct-fired unit heaters where they can diffuse cold air at major sources, as we explained in the June issue of American Artisan, will result in proper heat distribution, more continuous air circulation, and better temperature control when the factors that affect the throw of heat are recognized. How to avoid premature equipment damage caused by solvents in the air, and how to overcome the handicap of restricted fuel supply during certain periods of the year are two more important facts that must be considered by the dealer-contractor in every industrial installation.

Solvents Are Destructive

Chlorinated solvents in the combustion air, in more than a trace are highly destructive to the inside surfaces of heat exchangers. Such solvents most commonly present in degreasing processes are carbon tetrachloride, perchloroethylene and trichlorethylene. Though not harmful in unburned traces in the atmosphere, when they are burned with gas or oil the chlorine reacts to form highly corrosive hydrochloric



CHLORINATED SOLVENTS in the combustion air form a highly corrosive hydrochloric acid when burned with gas or oil, and are highly destructive to the inside surface of heat exchanger

acid. This corrosive action is not restricted to the burning of any one type of fuel.

No Corrosion Resistant Metals

Even such heat exchanger materials as Type 430 alloy, aluminized steel, and SAE 1010 steel protected with ceramic coatings have proved vulnerable to the presence of chlorinated vapors.

At present, there is no practical heat exchanger construction which has proved sufficiently resistant to rapid corrosion from hydrochloric acid in the combustion reaction.

Flue gas collectors, draft hoods and vent pipes are also subject to rapid deterioration in similar atmospheres.

Ways to Avoid Premature Damage

General ventilation of the space in which such solvents are present is not a positive answer, since the unpredictable room air currents can carry damaging vapors into the combustion air to some, if not all units. Exhaust hoods over the processing area to remove the vapors are not too reliable because the mechanical ventilation is seldom of sufficient velocity to avoid some stray vapors being diffused into the general area by cross drafts.

One very effective method of avoiding premature unit damage is to isolate the cleaning process in an enclosure which is maintained under a continuous negative pressure by mechanical exhausters.

Another answer is to locate the fuel burning equipment outside the heated space where it is free of possible contaminated air and introduce heated air through supply ducts.

How Customer Should Treat Expense

It is often difficult to explain to a customer how equipment damage can be caused by a chlorinated solvent concentration so slight that it cannot be detected by smell. Nevertheless, when the corrosion debris from the damaged equipment is subjected to chemical analysis, the residual chlorides found are irrefutable evidence of the cause of damage.

When the application is such that adequate remedial procedures are not possible, the customer should be educated to consider the frequent repair or replacement of heating equipment as part of the

Series Index

The subjects treated in this series on direct-fired heating equipment in industrial plants are:

Application ..... A breakdown of the various types of direct-fired unit heaters that are available and how they are equipped to meet practically any industrial plant heating requirement

Selection ..... Points out what items to consider when calculating the heat loss or heat gain so the job can be sized extremely close in order to give the customer better service in terms of greater comfort and lower original investment

Installation ..... Shows why experienced unit heater installers consider the "effective heating area" of a unit rather than "length of throw" as more realistic and a better guide when locating heat distribution equipment that has the proper air distribution accessories

Environment, Life Expectancy, & Fuel Data .. Several steps are given on how to reduce corrosive action and thereby prolong the life of the unit, and explains ways direct-fired unit heater equipment can be applied to meet the requirements of a dual fuel supply with good results

Economics & Sales Features .. Explains the merits of an LPG-air system as compared to the straight direct fuel system in terms of job size, physical arrangement of the heating equipment, amount of piping required, and provides guides to estimate fuel consumption

production expense rather than a capital expense for a long term write-off.

Unfortunately there is no data available to permit predicting rates of corrosion through a range of chlorine concentrations in combustion air. Even if this were available, it would be of questionable value since usage of the solvents may decrease or increase from time to time; or the cleaning process may be discontinued or added to a particular area without customer recognition of the situation created.

Installing a Dual Fuel Supply System

On installations in industrial plants where a supply of gas for fuel is restricted during certain periods of the year, dual fuel equipment may be considered and used with good results.

There are two ways in which direct-fired unit heater equipment can be applied to meet the requirements of a dual fuel supply. Where the standby fuel is undiluted liquid petroleum gas (LPG), natural — LPG dual fuel equipment can be installed. Where the standby fuel is natural-LPG-air (see explanation that follows), natural gas equipment with complete shutoff can be applied. Both may be thought of as dual fuel systems.

Initial Adjustments

In the natural-LPG dual fuel system, commercial propane, butane or mixtures of them are provided as the substitute fuel. Natural-LPG dual fuel AGA approved unit heaters provide for the use of straight LPG as the substitute fuel.

With proper initial adjustment, the main burners will operate on either natural gas or on the substitute LPG fuel without readjustment. The single natural gas pilot can be used to ignite both fuels.

There are two separated orifices in the dual fuel spud assembly which communicate with two separate gas manifolds, and separate automatic gas valves.

Manifold Pressure for Gas

Manifold pressure for natural gas depends on the combustion characteristics of that gas — usually 3.0 to 3.5 in. water gage. The manifold pressure for the LPG fuel is always 11.0 in. water gage. The orifices are sized so Btuh input is the same for either fuel.

In the natural-LPG air substitute fuel system, the substitute fuel is an LPG-air mixture. Many natural gas unit heaters equipped for complete shutoff are able to use the high specific gravity LPG-air mixture as the substitute fuel.

After initial gas pressure and primary air adjustment, the burners will operate on either natural gas or on the substitute LPG-air fuel alternately without

readjustment. The equipment has a single set of controls and spuds. Operation on either the base or substitute gases is at the same manifold pressure.

Choosing the Substitute Fuel

With respect to equipment operation and performance, choice of the optimum LPG-air substitute fuel depends on:

a) The type and design of gas-fired heating equipment.

b) The characteristics of the base natural gas.

c) The characteristics of the LPG used in the substitute LPG-air mixture.

For a rough estimate, a heating value of 1350 Btuh per cu ft may be used for the LPG-air substitute fuel, recognizing that final recommendations depend on the factors already enumerated.

Overall Heating Performance

It is possible to make a thermally equivalent LPG-air mixture, that is, one which will provide an orificed heat input equal to that of the base natural gas. Such a mixture may be satisfactory for industrial gas burning equipment (pressure burners) or where the quality or nature of the furnace atmosphere are the dominating requirements.

Principal Considerations

However, for gas-fired heating equipment with atmospheric burners, the principal consideration is the provision for acceptable flame characteristics. This may necessitate some reduction from the thermally equivalent LPG-air mixture.

Therefore, it must be recognized that, with the optimum substitute LPG-air mixture, the heat input may be slightly less than that with the base gas. This difference is usually of little significance in overall heating performance.

Necessary Information

Heating value and specific gravity of the base natural gas must be specified. Nature of the LPG to be used in the LPG-air substitute fuel must also be specified.

This information is necessary to provide the basis for the manufacturer's recommendation as to the desired heating value, and specific gravity of the substitute LPG-air fuel, and selection of the optimum orifice size to be furnished.

LPG-air substitute fuel is supplied from standby LPG-air mixing equipment through the same piping system which supplies the natural gas. There is only one fuel line to the equipment. The change from one fuel to the other, in this case, is accomplished by opening and closing the control valves located in the fuel supply system.

Ways to Avoid

Premature Equipment Damage

- Isolate the cleaning process in an enclosure which is maintained under a continuous negative pressure by mechanical exhausters.
- Locate the fire burning equipment outside the heated space where it is free of possible contaminated air and is able to introduce heated air through supply ducts.

Advantages of Natural-LPG-Air System

The natural-LPG-air dual fuel system is increasing in popularity because it offers certain advantages which will be described. Equipment to produce standby LPG-air substitute fuel is available from several manufacturers. Standby gas equipment is capable of supplying LPG-air mixtures over a considerable range of heating value. Control equipment is supplied to maintain the pre-selected mixture values specified by the customer.

Heating equipment manufacturers will be glad to provide information regarding the characteristics of the substitute LPG-air fuel which experience indicates will operate satisfactorily on natural gas burner adjustments.

Considerations which will help you evaluate the economics of an LPG-air system versus the straight dual fuel system will be presented next month. This evaluation will show that there is a definite breaking point in favor of one of the two systems.

Selecting A Substitute Fuel

With respect to equipment operation and performance, choice of optimum LPG-air substitute fuel depends on:

- The type of design of gas-fired heating equipment.
- The characteristics of the base natural gas.
- The characteristics of the LPG used in the substitute LPG-air mixture.

ELECTED TO HEAD Sheet Metal and Air Conditioning Contractors' National Association for the year 1960-61 are: (l to r) Dion E. Mannen, treasurer; D. E. Shytle, president; and H. E. Anderson, vice president

SMACNA Charts Course for the Future

Endless list of needs and increased responsibilities require changes within the organization and in the general plan of operation

IN HIS REPORT to delegates attending the 17th annual convention of the Sheet Metal and Air Conditioning Contractors' National Association in Boston, president R. K. de l'Etoile outlined the association's need for a charted course that future officers and board members could pursue.

He said, "It is certainly evident to our recent past president and our principal committee chairmen that our association has reached a position of maturity among construction contractor associations in this country.

"With each succeeding year we find more of our objectives reached and we find ourselves with greater stature among the other specialty contractor associations.

"We are proud to announce that during this past year one of our senior directors, Robert E. Peterson of Kansas City, was elected to the presidency of the Council of Mechanical Specialty Contractors Industries and in the few weeks since his election on January 24 has engaged in the activities of this office with vigor. This is one of many similar examples reflecting our new stature and sense of maturity.

"It should be evident that with such progress comes responsibilities. These include a need for:

1) Continuing the negotiation relationship which has been created with the Sheet Metal Workers' International Association.

2) The continuation of our association with other specialty contractor associations dealing with our common problems.

3) A continuing vigorous defense of our areas of jurisdiction in cooperation with our international union and the authorities established for this purpose.

4) Upgrading our industry by recruiting and training better administrative personnel and contributing time, money and personal effort to the training of skilled sheet metal workers.

"The list of needs is almost endless, reaching into every small phase of our operations.

'As we plan our future course to meet these needs and responsibilities, we will be required to face courageously some changes within our organization and in our general plan of operation. I would strongly recommend these steps be taken under consideration by future officers and board members:

1) Establish for this association a paid executive officer, preferably an executive vice president, similar to executive officers now permanently employed by other contractor associations empowered to act for the association particulary on assignments where coordination with similar groups is required.

"Under our present plan of operating, we demand time from busy, active contractors, who are our president, vice president, treasurer and principal committee chairmen. If these jobs are to be done conscientiously, it is literally impossible for these men to properly fulfill their roles as

representatives of this association and at the same time conduct the affairs of a specialty contracting business.

2) Establish the executive offices of this association in Washington, D.C.

In years past, we have imposed heavily on the time and patience of contractors situated in and around Washington, D.C., fulfilling assignments in that important area. It is noted that the other principal contractor associations have headquarters in Washington. It is also true that all of the offices of the international construction trades' unions are located in Washington. It is, of course, the seat of our federal government and the place where our federal bureaus do business.

"It follows naturally that the National Joint Board for the Settlement of Jurisdictional Disputes meets in Washington, and the Council of Mechanical Specialty Contracting Industries is located there. The AGC and national constructors, likewise, have their headquarters in Washington, D.C.

"We should plan at the earliest possible date to be located at this more central organizing point.

3) Establish a paid secretarial staff for our national association consistent with the demands which will be made on this national office by these future plans. At the present time, the principal burden of secretarial work is borne by our highly respected executive secretary Joseph D. Wilder.

"The establishment of an executive secretarial staff is necessary now, while secretary Wilder's service is still available to us for training such personnel and orienting them to the needs of our association members in this industry.

"I envision the need for two highly qualified executive secretaries in our future—one to deal with the tasks related to labor relations, contractor association relations, legal business, and legislative matters; the other to deal with administrative matters concerning chapters, technical sections, convention planning, group insurance fund, publications and similar duties. It should be clear that I cast no discredit on secretary Wilder and I have had good reason in this past year to wish that he were triplets and would be with us forever. The members of this association are deeply indebted to him for his tireless effort.

"I strongly recommend that this association start now to supplement its staff so that we will have a harmonious, smooth-working organization of this general form in harness by 1964.

"All of you who read the trade journals, the financial journals, the newspapers and the popular magazines are aware of the dynamic forces which now influence our national community, our economy, and our future as part of the construction industry. You read of the population explosion — you read of the evolution of the electronic age, the space age, the missile age, urban redevelopment— these are the strong forces which will insure our future if we plan for them. If we do not plan for them, they will catch up with us and trample us to death as they pass."

Training Provides Key to Future

MUTUAL INTEREST of labor and management in the training of skilled workmen to handle the demand for sheet metal in the future is demonstrated by Edward F. Carlough, general president, SMWIA, (second from left) and David S. Turner, general secretary-treasurer, SMWIA (second from right) as joint apprenticeship training award is presented to Marlowe C. Hodge (left) representing the Los Angeles committee which won the 1960 contest for the best training program. The plaque is being presented jointly by SMACNA president R. K. de l'Etoile (center) and Frank Kramer (right).

Mr. Kramer is chairman of the National Joint Apprenticeship and Training Committee for the Sheet Metal Industry which annually sponsors a national apprenticeship contest and provides three awards for each of the four years of the apprenticeship training program. Award winners were announced in June American Artisan, page 22.

SMACNA Board of Directors

Five new directors were elected for four year terms. They are: Richard H. Budde, Budde Sheet Metal Works, Inc., Dayton, O.; A. T. Ihde, Alfred Goethel Sheet Metal Works, Inc., Milwaukee, Wis.; Richard A. Hepper, Puhl and Hepper Mfg. Co., Inc., St. Louis, Mo.; Wm. J. Knecht, Charles H. Knecht & Sons, Camden, N.J.; and Walter Hoffman, Buensod-Stacey, Inc., New York City, New York.

Directors with one year remaining to serve on the board are: Robert L. Bayless Jr., Valley Sheet Metal Co., Phoenix, Ariz.; R. K. de l'Etoile, Delbrook Engineering Inc., Cambridge, Mass.; D. E. Shytle, Combustioneer Corp., Washington, D. C.; Dion E. Mannen, Mannen and Roth Co., Cleveland; and M. A. Waldinger, Iowa Sheet Metal Contractors, Inc., Des Moines, Iowa.

Those with two years to serve are: Gilbert G. Dorsett, Keetch Metal Works, Dallas, Texas; Harvey E. Anderson, Anderson and Litwack Co., Chicago; Clovis Hendry, Lundin-Hendry, Inc., Baton Rouge, La.; L. B. McConnell, McConnell Sheet Metal, Inc., Lansing, Mich.; and A. B. Osgood, The Day Co., Minneapolis.

Those with terms ending in 1963 are: Roy M. Burk, Western Heating & Sheet Metal, Inc., Olympia, Wash.; Marlowe C. Hodge, Hodge Sheet Metal Products, Los Angeles; J. A. Nyland, Nyland Sheet Metal Works, Indianapolis; Andrew Stuart, Anderson Sheet Metal Co., Providence; and Rogers B. Toy, Carrier Corp., Atlanta, Georgia.

Procedures to Follow When Testing High Pressure Duct Systems

TOOLS AND TECHNIQUES for testing high velocity duct systems were explained to SMACNA members by (l to r) W. A. Bingham Jr., W. M. Harmon and W. A. Kuechenberg

FAILING TO FIND a leak in a high pressure duct system during the construction stage can result in expensive repairs after the building has been occupied was the opinion of each of the panelists covering this subject.

Believing that knowledge of how leaks occur is the best method of preventing them, the panel pointed out that current practices are adequate, but only when correct procedures are followed. Any abbreviation of the procedures could result in leaks after the initial tests were performed and found to meet the requirements.

Source of Leaks

Requirements, in general, were set at 8 in. water gage static pressure for ducts 40 in. in diameter or less. Over 40 in. in diameter, the test pressure should be 9 in. water gage.

One source of leaks that can be prevented is at joints where adhesives are used. Too often, it was said, due to inadequate working room insufficient adhesive is applied to the joint. When the adhesive dries, the thickness is not enough to withstand the operating pressure.

In cases of this sort, it was recommended that three or four days after the joint has been initially sealed, the practice of using a strong duct tape over the joint would add insurance to a well-sealed system.

WAYS TO ORGANIZE a sheet metal shop for maximum performance through layout and use of mechanized tools were described by this panel (l to r) Dion Mannen, A. B. de l'Etoile, H. E. Anderson, L. L. Pierce and Walter F. Limbach

New Plant Layouts Offer Ways To Reduce Shop Costs

Panel consisted of contractors who recently built new shops or remodeled their existing facilities to make it possible for work to flow through faster and easier

FOLLOWING the convention theme, SMACNA members described techniques that contribute to reducing initial costs on items handled frequently in the sheet metal shop. A panel of five contractors who recently built new shops or remodeled their existing shops to make it possible for work to flow through the plant easier and faster, consisted of H. E. Anderson, Anderson and Litwack Co., Hillside, Ill.; L. L. Pierce, The Singleton Co., Springfield, Va., Alfred B. de l'Etoile, Delbrook Engineering, Inc., Cambridge, Mass.; Walter F. Limbach, The Limbach Co., Pittsburgh, Pa.; and Dion E. Mannen, Mannen and Roth, Cleveland, Ohio. The panel was moderated by Dion E. Mannen.

A summary of the suggestions offered by this panel includes the following:

1) Prepare a detail drawing of the entire building.

2) Determine percentage of space available for office and stockroom areas. Mark them off for partitioning.

3) List all equipment to be placed in shop area.

4) Prepare cardboard models (to scale) for each piece of equipment to be used.

5) Place cardboard models to achieve work routes that will prevent overlapping and duplication. This can best be done by drawing colored lines between equipment to show work flow.

6) Make several arrangements to achieve most versatile use of equipment and workmen.

7) Group equipment and tools for related functions.

8) Arrange component flow to terminate at assembly point common to larger and heavier components.

9) Support heavy hand tools from overhead booms or brackets.

10) Use movable tables or carts as much as possible for transferring parts between machines.

11) Use machines that perform multiple operations as often as practical.

12) Utilize dies whenever possible.

13) Provide adequate working room around each piece of machinery and work bench.

14) Design lighting arrangements to prevent shadows and glare with adequate light at all working areas.

15) Provide good ventilation throughout the building.

16) Utilize space near the shipping area for temporary storage of parts.

How Location of Supply And Return Systems Affects Air Distribution in Split-Level House

Improper location of supply outlets cannot be offset by the location of a return intake

By Edward J. Brown
Research Associate
University of Illinois

DUCT DESIGN and equipment selection in a split-level house, as we explained in the June issue of Amercian Artisan, must be based on accurate calculations of heat gains and heat losses. Tables 2 and 3, that appeared last month on pages 35 and 36, enabled us to calculate these gains and losses for various rooms in the split-level house according to the building materials used, and direction faced.

Our calculations showed that the duct system for our model spilt-level house is based on a heat loss of 92,180 Btuh and a heat gain of 40,080 Btuh. The design procedure was in accordance with that given in NWAHACA Manual 9. The supply and return air duct systems were designed on pressure losses of (supply) 0.15 and 0.05 in. (return) water gage. The supply outlet and return air inlet locations are shown in Fig. 1 and the duct system in Fig. 2.

Table 1 is a summary of the heating and cooling air-flow rates required for each room. The air flow rates were determined by procedures in Manual 9. The last column of the table lists the air flow rate, heating or cooling, which was finally used in the sizing of the ducts and supply outlets for each room. In each case the maximum air flow rate was used. There was no way of determining the air flow rates without following the design procedure.

Basement supply outlets in the split-level house are low sidewall diffusers placed approximately 1 ft above the floor and adjusted to discharge air horizontally. Studies of basement heating conducted at the University of Illinois* have shown that this supply outlet location will result in acceptable floor-to-ceiling temperature differences and will also help provide warm basement floors. The basement is not to be cooled, therefore no consideration was given to cooling in selecting the supply outlets.

Low sidewall diffusers are supplied from above through wall stacks attached to the outside walls. This arrangement of supply outlets will provide acceptable temperatures in the basement and increase its usefulness as a work area.

Since all ductwork is exposed, the labor necessary to install this system is not appreciably more than that which would be required to install a ceiling outlet system which would not, in this case, be satisfactory for heating.

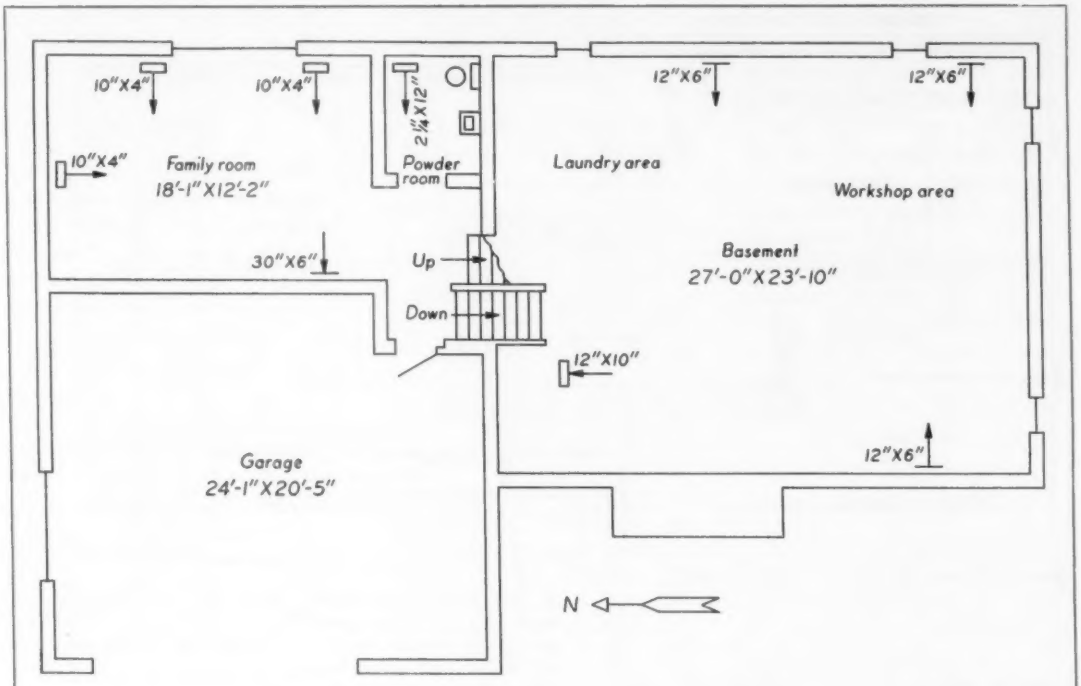
The family room floor diffusers are supplied with conditioned air from a deadend perimeter duct embedded in the concrete slab. This duct originates in a subfloor plenum which in turn is connected directly to the furnace plenum by a trunk duct. The perimeter duct will take care of heat losses through the edge of the slab and provide satisfactory floor surface temperatures.

Floor diffusers are excellent for heating and are suitable for cooling with air flow rates that provide face velocities greater than 500 fpm.

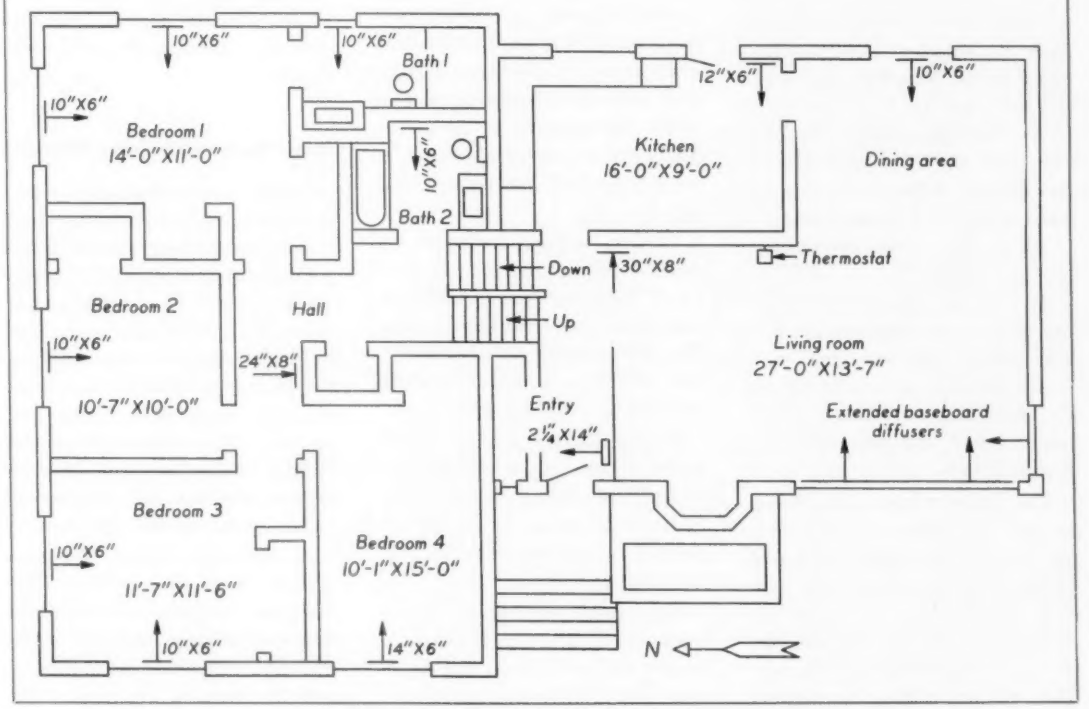
The proper heating of the family room is important. High sidewall or ceiling outlets or a so called inverted perimeter system with floor diffusers installed in the ceiling and discharging downward, will not provide satisfactory floor surface temperatures or properly supply warm air to intercept cold drafts from the uninsulated sidewalls.

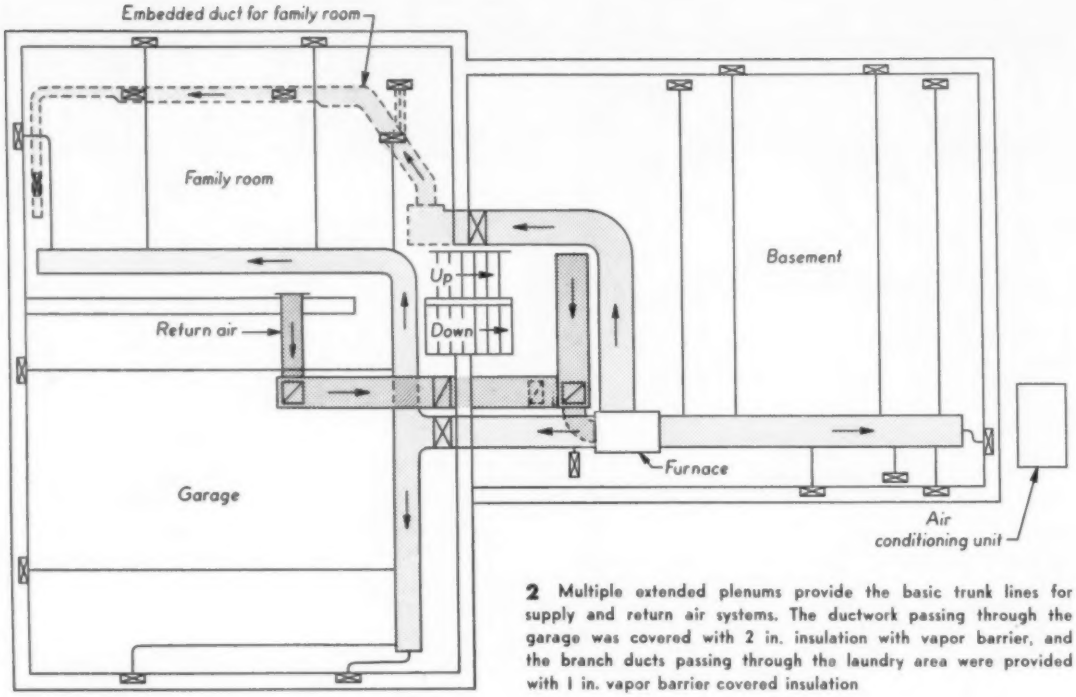
No direct procedure is given for the design of a deadend perimeter duct system in Manual 9, in which ducts are assumed to be surrounded by air. The Manual 9 procedure can be applied to the embedded duct system by assuming that the temperature drop in the duct was the same as that in a duct surrounded by air. With

*"Supply Outlet Locations for Basement Heating", by J. R. Wright and D. R. Bahnfleth. ASHAE Journal Section, Heating, Piping and Air Conditioning August, 1958.



1 Multi-level house utilized perimeter air distribution system on each of the four levels. A combination of extended baseboard, low sidewall, and floor diffusers were used with ceiling and high sidewall grilles for return openings in the basement and family room, and baseboard returns were used in the bedroom and living areas.





2 Multiple extended plenums provide the basic trunk lines for supply and return air systems. The ductwork passing through the garage was covered with 2 in. insulation with vapor barrier, and the branch ducts passing through the laundry area were provided with 1 in. vapor barrier covered insulation

that asumption, ducts were sized directly from data in the manual.

Heating and Cooling Outlets

An extended plenum suspended from the basement ceiling supplies both the basement and the living room levels. Extended baseboard diffusers are used in the living room under the windows. The dining room and kitchen outlets are low sidewall diffusers. A floor diffuser is provided for the entry.

All of these outlets are satisfactory for heating.

To maintain acceptable room-air temperature differentials during cooling, the extended baseboard diffusers were adjusted for 750 fpm face velocities, and the low sidewall diffusers 500 fpm face velocities.

The different types were chosen to suit the areas in which they are installed. Extended baseboard diffusers fit under the low windows in the living room. In the dining room, the low sidewall outlet is centered under the window. The kitchen diffuser is located next to the door where it will not interfere with cabinets. The selection of an entry supply outlet was limited to a floor diffuser because of space limitations.

A second extended plenum suspended from the garage and family room ceilings provides the conditioned air for the bedroom level. Low sidewall diffusers are located under the windows in all rooms. This type of outlet, so located, is suitable for both heating and cooling.

During heating, the rooms located over the garage will have lower floor surface temperatures than those above the family room. The low sidewall diffusers under the windows will help to prevent cool drafts at the floor level.

During cooling, with a face velocity of 500 fpm or greater, the outlets will direct the cooled air up into the rooms to provide acceptable temperatures within the occupied zones of the rooms.

The return air system is uncomplicated. One central return is located on each level. The basement and family room returns are located in the ceiling and in the high sidewall, respectively. Baseboard return locations are used on the bedroom and living room levels. This arrangement allows a minimum of ductwork and also permits the use of stud and joist spaces as part of the return air system.

Importance of Supply Outlets

Supply outlet locations are important to prevent drafts and provide acceptable temperature differentials within the occupied zones of the rooms. Improper location of supply outlets cannot be offset by the location of a return intake. Returns are *not* effective in collecting cold air from the floor during heating or warm air from the ceilings during cooling. Proper supply outlet location will prevent the occurrence of these problems.

A sufficient number of return intakes are provided to prevent movement of large volumes of air through hallways or down stairways which would cause objectionable air motion. The return air

grilles were sized to produce 300 to 400 fpm face velocities which will not cause noise probems.

Ductwork Insulation

Insulation is required on some of the ducts to maintain the proper supply outlet air temperatures during heating and cooling, and also to prevent sweating of ductwork during cooling.

The extended plenum in the unconditioned garage requires 2 in. of insulation with the vapor barrier on the outside to prevent condensation of moisture on the ductwork. The branch ducts in the garage will not require insulation if located above the insulation between the garage ceiling and the bedroom floors. Heat loss from the branch ducts will help to warm the floors during the winter.

The basement is an unconditioned space during the summertime. In spite of the fact that the stairway is open to the other levels which will allow the basement air to be conditioned to some extent, the laundry area may produce enough moisture to cause condensation on the ductwork. One in. of insulation with the vapor barrier on the outside will prevent sweating.

Capacity of Cooling Unit

A single furnace is located in the basement and is controlled by a thermostat located on the east inside wall of the living room. An evaporator coil is mounted in the plenum of the furnace. The air cooled condensing unit is located on the south side of the house. The gas-fired furnace has an input of 125,000 Btuh and a bonnet capacity of 100,000 Btuh, which provides approximately 4 percent reserve capacity above the calculated heat loss of 92,180 Btuh.

The cooling unit has a capacity of 39,000 Btuh which is approximately 2.5 percent less than the calculated heat gain of 40,080 Btuh. However, the maximum heat gain will not occur on all levels simultaneously and the slightly undersized unit will have sufficient capacity.

For example, the load on the family room will be decreasing before the peak loads are experienced on the living room and bedroom levels. Therefore, the selected unit will have sufficient capacity to maintain temperatures very close to 75 F even on design days when a temperature slip of 1 to 2 deg may be expected.

Balancing the System

The system was designed and the equipment selected to adequately heat and cool each level of the house. An acceptable temperature balance can be maintained throughout the house by careful adjustment of either supply outlet dampers or balancing dampers in the branch ducts.

This system should be balanced temperature-wise. That is, air-flow rates should be adjusted to maintain a uniform temperature throughout the house at a distance above the floor equal to the mounting height of the thermostat. Readjustment of the system will be required in changing from heating to cooling and vice versa.

Seasonal readjustments of supply outlet dampers or balancing dampers in the individual branch ducts is tedious and time consuming. On this job, it would be possible to install a balancing damper in each of the three trunk ducts near the conditioner. Such dampers can be set to summer or winter positions to provide the proper seasonal balance.

The summer and winter positions must be determined by trial during a heating and a cooling season. However, once the damper positions are determined, the need for adjustment of individual outlet dampers is eliminated.

Desirable Characteristics

Split-level houses are a common outgrowth of the two-story and the ranch style houses. It includes the desirable features of both, and public preference indicates a continued increase in the number constructed each year.

Due to the structural characteristics of most split-level houses, air distribution equipment is more difficult to install than in other types of houses, yet is capable of providing superior comfort than any other type of heating system. Performance of air conditioning equipment in a split-level house will be reflective to the good engineering practices outlined in this and last months article.

Table I — Air-Flow Rates, cfm

Room	Heating Air-Flow Rate	Cooling Air-Flow Rate	Air-Flow Rate For Which Ducts Were Sized
Basement	283	——	Heating
Family Rm	342	228	Heating
Powder Rm	38	10	Heating
Kitchen	92	74	Heating
Dining Rm	80	71	Heating
Living Rm	164	443	Cooling
Entry	87	40	Heating
Bed Rm #1	92	98	Cooling
Bed Rm #2	57	62	Cooling
Bed Rm #3	100	126	Cooling
Bed Rm #4	74	121	Cooling
Bath #1	38	34	Heating
Bath #2	6	6	Either

Although it is impractical to set up a standard that would require close temperature regulation in all parts of a house under all possible combinations of internal load and weather, it is possible to adjust a system to a minimum temperature variation at a particular time of day

When, Where and How To Measure Variations In Room Temperature

By S. W. Reid
Air Conditioning Engineer
Gilbert Associates, Inc.

TWO QUESTIONS should arise after giving some thought to the third standard on the American Artisan *Standards Card* for rating residential cooling systems which rates good, fair or poor if the temperature variation between the coolest and warmest rooms is less than 2 degrees, between 2 and 4 degrees, and over 4 degrees respectively.

First, when, where and how are the temperature variations to be measured?

Second, of what design factors must the dealer-contractor be cognizant to assure that his systems will qualify for a rating of GOOD?

A contract for air conditioning generally includes a statement of inside and outside design conditions. For example, the statement may read that the inside conditions will not exceed 78 F db and 50 percent rh for outside conditions up to, say, 95 F db and 78 F wb. These are the figures assumed by the designer for purposes of load calculation, and in this connection they are most essential and useful.

What, however, is the significance of these figures for the owner in terms of ultimate system performance? The answer to this question is complex, for it depends in part upon the previous experience of the owner and in part upon the combination of technical skill and conscientiousness of the dealer-contractor.

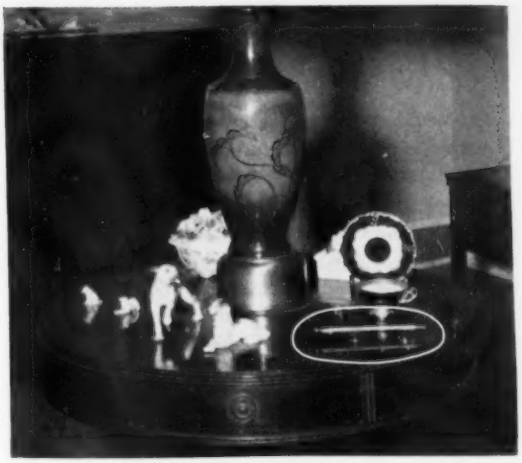
Interpret Design Conditions

Suppose, in the normal course of business, a dealer-contractor has successfully concluded the necessary preliminaries with a homeowner for a residential cooling installation. He has presented a proposal which includes a statement of the design conditions agreed upon and is now following through, feeling certain that a contract will be signed. Unlike most prospects today, this homeowner knows what consti-

tutes good air conditioning. When the dealer-contractor calls, the homeowner confronts him with several interesting questions:

"Mr. Contractor, your proposal states that your system is designed to maintain my house at 78 F db, 50 percent rh. If I want to determine whether or not your system meets this specification, should I measure the temperature in every room or does it apply to only one room, say the one with the thermostat?

"Since you and I both know that there is a temperature gradient from the floor to the ceiling in each room, at what level does the 78 F apply? In addition to the gradient, it's been my experience that the temperature of a given room is not constant, but varies, say, from the corners to the center. What part of the room will be 78 F, and how much variation will there be between the coolest and warmest parts of the room? When you say 78 F are you talking about a maximum for any part of the house, or is this an average temperature?"



TEMPERATURE MEASUREMENTS should be made at a location near the center of a room at about table height, and not be subject to any concentrated heat sources

Owner Relies on Previous Experience

The chances that a dealer-contractor would ever be asked such questions is just about as remote as are the chances that he would be prepared to supply the answers. The reason he would not be asked is that most owners are not qualified to evaluate the performance of air conditioning systems.

Owner response is nearly always related to previous experience. For example, people who are accustomed to no cooling will rave about the relief afforded by a window unit in the bedroom. They will not complain about room-to-room temperature variation, floor-to-ceiling gradients, moderate noise or drafts, temperature variation in the room or any of the other shortcomings of such an arrangement as compared with good central air conditioning.

Use Standards Card to Upgrade Prospect

People with window unit experience will be delighted with central air conditioning even though it may rate only fair or poor in many categories of the new *Standards* card. This does not mean that the dealer-contractor should take advantage of an inexperienced public. Rather, he should take the lead in selling the public on the best that modern research has made available on a practical basis. The American Artisan *Cooling Standards* card is the tool for this purpose.

Our opinion that the dealer-contractor would not be prepared to answer such detailed questions as our informed prospect might ask about room temperature stems from the same premise we used to explain why the average owner would not ask such questions.

Heretofore, the dealer-contractor has seldom been called upon to produce the refinements now being proposed. Consequently, his judgment as to what constitutes a good system is related largely to his experience as to what it takes to satisfy the average owner who, as we have noted, is not hard to satisfy so far as air conditioning is concerned.

Facts About Indoor Temperature

Let's consider some practical facts about the indoor temperature which is so casually entered in many air conditioning proposals. The capability of the air conditioning system for maintaining this temperature starts with the load calculation. Careful analysis of heat sources makes it possible to apportion the required cooling capacity to the individual rooms. If this was not done, it would not be practical to control a number of rooms with a single thermostat.

In other words, the successful use of a single thermostat to control the temperature in a number of rooms, in most cases an entire house, requires that there be a close and realistic match between the room heat gain and the cooling capacity assigned to it.

Correct an Unbalanced System

Even when this is done as accurately as possible, there will be periods when intermittent or occasional loads such as the transient solar load, cooking loads, the load of extra people, etc. are imposed upon the system. These will temporarily upset the normal room-to-room temperature balance. If this unbalance cannot be tolerated, it must be handled automatically by zoning or corrected by damper adjustment.

Because there are changing components of the cooling load that can affect one room more than another, we must concede that it would be hardly possible for

Simultaneous temperature readings in different rooms should be made with the same instrument in order to eliminate differences in response time

a residential system controlled by a single thermostat to maintain close temperature regulation in all rooms under all conditions.

However, we can expect that a system can be adjusted to a minimum temperature variation at a particular time of day, say the time at which the load was calculated. Actually, any time of day could be chosen for the balance, but the time of peak total load appears to be the best answer to the question of when the check should be made.

Where And How to Check Temperatures

We must also consider where and how the check of room-to-room temperature should be made. For some people, the room thermostat with its little thermometer seems to be a more important index to comfort than their own personal reactions. Actually, it should never be considered inviolate because it's quite possible that the thermostat is located in a part of the room which may not be truly representative of room conditions.

Choose Location Carefully

An owner should be more interested in the temperature in those parts of the room which he most frequently occupies. Therefore, it seems quite reasonable to agree that temperature measurements should be made at some location near the center of the room at about table height. The location chosen should not be subjected to any concentrated heat source such as a lamp or other electrical device or from a direct play of sunlight.

Temperature is ordinarily measured with glass thermometers. These come in a range of sizes and qualities. The dealer-contractor should equip himself with a supply of good quality, dependable thermometers which can be read to ½ degree. A stem length of at least 10 inches is recommended.

Use One Type of Instrument

In some cases it may be desirable to use electrical instruments for measuring temperature. However, it should be kept in mind that these instruments are usually more sensitive than glass thermometers and will respond more quickly to changes.

For example, a temperature change of, say, 5 degrees in two minutes registered by an electric thermometer may show as only 3 degrees on a glass thermometer due to slower response. If properly calibrated, both instruments would read the same if held a sufficient time in a constant temperature.

The point here is that simultaneous readings in different rooms should be made with the same type instrument in order to eliminate whatever effect differences in response time might make in the readings.

How to Attain the Desired Standard

In the preceding discussion we have given substance to the standard for room-to-room temperature variation by answering the questions as to when, where and how these temperatures are to be measured. We have seen that it would be impractical to set up a standard that would require close temperature regulation in all parts of a house under all pos-

Average Temperature Difference at Thermostat-Room Air at 30 in. Level

Room	*S 54-1	**S 54-2
East Living Room	0.1	−0.2
West Living Room	−0.1	−0.3
South Bed Room	1.1	1.1
Bath	1.7	1.2
North Bed Room	1.5	1.9
Dinette	1.1	1.3
Kitchen	0.9	0.7
No. of days in Series	27	24

*S 54-1: Test series with continuous blower operation.
**S 54-2: Test series with blower cycled with compressor.

TEST RESULTS for University of Illinois Research Residence when occupied by a family of two adults and two infants. Thermostat was located in a center hall. Note that room-to-room temperature variation would allow a rating of GOOD for this house in accordance with the new American Artisan *Cooling Standards* card

sible combinations of internal load and weather. We have reasoned, however, that it is possible to attain the desired standard provided that:

1) The check is made at the time of day chosen for the cooling load calculation and that intermittent or occasional loads are not contributing.
2) The temperature measurement is made at the center of each room at about table height and where it is not influenced by localized heat sources.
3) The temperature measurements are made with instruments of like accuracy and sensitivity to temperature change.

Design Factors that Affect Variation

Now we'll proceed to answer the second basic question concerning design factors which might affect room-to-room temperature variation. A mere plan of a house does not give sufficient information for calculating the cooling load with the accuracy needed for attaining a room-to-room variation of less than 2 degrees.

Such details as exact house orientation, shading available from adjacent buildings or trees, use of inside blinds and drapes, use and effectiveness of awnings and roof overhangs, use of solar screens, abnormal infiltrations, etc. must be investigated and properly evaluated. Many of these factors are either overlooked or ignored in residential load calculations being made today because there is a tendency toward more simplification in load calculation rather than a tightening up of some of the loose ends.

Evaluate Heat Gain of Ducts

In addition to the type of factors described above which have a direct bearing upon the cooling load, the dealer-contractor should also evaluate and make allowances for heat gain to ducts feeding remote rooms. He should also look for instances where distribution within a room may be improved by using a special outlet or by selecting an outlet location which is, perhaps, a little more costly than usual to reach.

A duct in which conditioned air enters at 18 degrees below room temperature and leaves at only 16.2 degrees below is causing a full 10 percent loss in the sensible heat removing capacity of the air.

As for poor distribution, it should be remembered that the heat entering the room can be properly absorbed by the conditioned air only if this air is well mixed with the room air and is not recirculated before it has done its job. Inadequate mixing or short circuiting of the conditioned air would be evident as uneven room temperature and could hardly be expected to produce the minimum room-to-room variation which we are hoping to achieve.

The American Artisan *Standards* Card is derived from several sources of information among which are test reports from the University of Illinois. The following paragraph is quoted from one such report.[1]

"The system installed in the Research Residence was adjusted to give satisfactory room-to-room temperature balance at the 30 in. level at approximately 3:00 p.m., the time at which the maximum calculated external heat gain occurred. The final balance adjustments were made on a day when the outdoor temperature at 3:00 p.m. was approximately 93 F. The maximum room-to-room temperature difference at that time was 2.0 degrees. The average temperature difference from the thermostat temperature was −0.8 degrees. The balance was measured at approximately the same time each day (3:00 p.m.) and the average conditions maintained during each series are shown in Fig. 1. These values include data taken both with the compressor operating and with the compressor off."

1. University of Illinois, Engineering experiment Station, Mechanical Engineering Department Warm Air Research Series SC-4A-1. "Study of Cooling With A Small-Pipe Perimeter System In Research Residence No. 2, 1954", by D. R. Bahnfleth and H. T. Gilkey.

Responsibility of Dealer-Contractor

The homeowner has to rely on the technical skill of the dealer-contractor to use all available load information and properly interpret and translate it into a cooling system design. He must also rely upon the conscientiousness or sense of responsibility of the dealer-contractor to follow through with a test and adjust or balance the system until it meets the standards imposed upon it.

As noted earlier, the residential air conditioning prospect is not qualified to demand the degree of refinement which is available. The dealer-contractor, however, is capable of producing the refinement and he should accept his responsibility and not be satisfied to sell only the minimum that will be accepted.

Furnish architects with information that will enable them to design systems that provide conditions listed under the "Good" classification on the *Cooling Standards* card, and you will find the prospect will be more willing to accept a bid that is higher than one based on equipment that offers only a small degree of relief from summer heat and humidity

Uses Cooling Standards To Inform Architects And Upgrade Prospects

STANDARDS FOR RATING Residential Cooling Systems card is explained to each prospect by E. M. Culver to provide the buying information needed to wisely place their contract for summer air conditioning

HELPING ARCHITECTS write specifications for year 'round air conditioning systems is providing E. M. Culver, Culver Heating and Air Conditioning Co., St. Simons Island, Ga., with an excellent sales tool. "Many architects aren't aware of recent developments in residential air conditioning practices," says Mr. Culver, "and if permitted would (with all sincerity) write specifications that would rate only 'Fair' when judged against the capabilities of today's equipment. We use American Artisan's Standards for Rating Residential Cooling Systems to help them design systems that will provide the conditions listed under the 'Good' classification on the *Standards* card.

Standards Spell Out Performance

"Architects we contact are now using the 12 points given on the *Standards* card as guides when spelling out the expected performance of the installed system."

Specifications written to meet the conditions for the "Good" classification are:

Room temperatures	Between 76 and 78 F
Air temperatures between 3 and 60 in. level	Less than 4 degrees

Temperature variations between rooms	Less than 2 degrees between coolest and warmest rooms
Humidity	Stable
Drafts	No noticeable drafts in any occupied area
Ventilation	No stale odor in house
Noise	Equipment is is quiet
Blower operation	Constant
Appliance venting	All appliances vented
Air filtering or cleaning	Clean or filtered
Insulation of ducts (based) on temperature rise)	Basements and unvented crawl spaces, ½ to 1 in. with exterior vapor barrier (to control condensation) Crawl space, vented 1 in. Attic space 2 in.
Sun shading of glass areas	Outside venetian blind; ventilated canvas or metal awning; outside solar screen

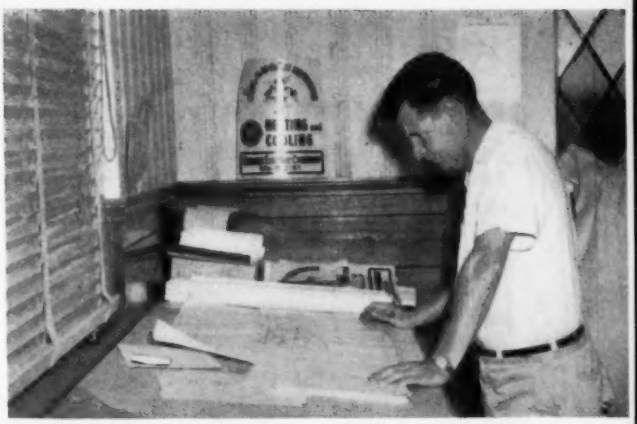
According to Mr. Culver, all bids for jobs that must meet the above conditions are much higher than the prices normally asked by many dealer-contractors who make quotations based on equipment that can offer only a small degree of relief from summer heat and humidity.

Work Closely with Architects

Once an architect has spelled out the performance that is to be expected from the installed system, it becomes much easier to offer a bid that includes the money necessary to properly balance the air distribution system and to handle the service costs incurred during the first year of operation.

When working with architects to design an air conditioning system that will adequately serve the needs of a planned residence, Mr. Culver points out the advantages of multiple return openings. It's easier for air to be returned to the conditioning equipment plus the fact that it tends to reduce both drafts and noise due to air entering the return system at high velocity.

When it becomes necessary, due to floor plans, to locate conditioning equipment close to living rooms or bedrooms, the use of internal insulation in the return duct is frequently employed to prevent transmission of machinery noise to rooms where the house occupants are normally quiet.



FLOOR PLANS and estimating forms provide the equipment and air distribution needed to meet the specifications set forth on the Standards card

Use Cooling Standards as Guide

Another feature used by the Culver company to demonstrate its ability to install systems that meet the Standards for Rating Cooling Systems specifications is the use of turning vanes in air supply trunks where the openings are at the far end of the duct system.

It's been found that the use of turning vanes in residential systems has improved the quantity of air delivered to distant points in the house without hav-

SPECIFICATIONS for a proposed residential air conditioning system are spelled out in correspondence with architects

ing to increase the blower capacity or motor hp requirements to supply the desired air quantity.

Devise Load Estimating Form

Each load estimate is made from the architect's floor plan and specification, and the heat gain factors are checked against those listed by the architect.

The Culver company has devised an estimating form of its own. It is a combination of a form supplied by the equipment manufacturer and the form recommended by the National Warm Air Heating and Air Conditioning Association.

Air quantities and velocities at supply openings are determined from the load estimating form.

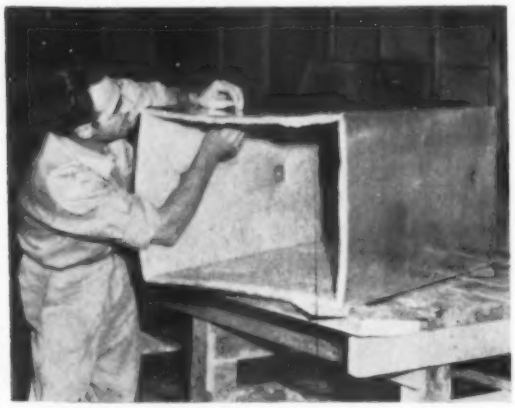
Base Sales Presentation on Standards Card

The Standards for Rating Residential Cooling Systems card is also used to explain to homeowners interested in adding summer air conditioning equipment to their existing air distribution system. When talking to prospects for add-on air conditioning, Mr. Culver uses the 12 points on the *Cooling Standards* card to help the prospect visualize the essential information he must become familiar with in order to select a dealer-contractor who is capable of providing the comfort desired.

Sales presentations are based around the points on the *Standards* card plus the benefit of temperature and humidity control.

Give Personalized Service

After a system has been installed and when the outside temperature reaches a vicinity near the design temperature, the air conditioning system is balanced to provide comfort according to the comments of the house occupants.



INSULATION LINED DUCTWORK is one of the sales features used to qualify higher prices asked for well-designed systems

NEW TOOLS and techniques keep workmanship quality high and help cut fabrication costs. Bob Grooms, wholesaler's representative, demonstrates to E. T. Miller, shop man, how to use new tool for fastening turning vanes in elbows, another quality feature of Culver air distribution systems

The homeowner is asked if one room appeared to be warmer or cooler than another, if drafts had been noticed in one location or another, if equipment operation is noticeable, and the other features which people living in the air conditioned environment are familiar. These answers provide clues for the serviceman to help him in the balancing procedure.

The Culver company serves the communities of Brunswick, Darien, Jesup, Nahunta, Needmore and other towns of this size within a 40 mile radius of St. Simons Island.

Many leads are routed to the company because it has built a reputation for doing quality work. Other leads come from friends who grew up with Mr. Culver in the area.

Credit Check and Service Charge

However, when newcomers to the area indicate an interest in having their homes air conditioned, the first step Mr. Culver takes is to determine the credit rating of the person responsible for payment. He does this before arranging an appointment to make the sales presentation or undertake to make an estimate.

This credit check eliminates wasting time on prospects that either cannot afford home air conditioning or do not have a reputation for meeting their financial obligations.

In estimating the selling price, Mr. Culver adds 5 percent to handle service charges during the first year of operation. This 5 percent is deposited in a separate bank account and all service charges are charged against this account.

Greater Return on Advertising Investment When Professionals Handle All Promotion

Advertising can be an effective business tool that will enable a dealer-contractor to remain competitive if he has the skill and training to prepare ads that produce good results continuously

SCRAP BOOK of published ads is periodically reviewed by John G. DeHaan as he reviews proposed ads submitted by local advertising agency that are published every Tuesday

"IT'S DIFFICULT to evaluate the effectiveness of advertising at the dealer-contractor level, but you are able to tell when it's 'ringing the bell' or 'missing the boat'. Sometimes, ads that you put together carefully and expect will produce better than average results turn out to be complete busts. Other ads, that you slap together in a hurry to meet newspaper deadlines bring in good results. Advertising is like most other businesses because it takes skill and training to prepare an advertisement that will produce good results continuously. You've got to know how to do it, to do it right," said John G. DeHaan, president of DeHaan Heating and Roofing Co., Kalamazoo, as he explained why he gave up preparing his own advertisements and engaged an advertising agency to handle the job for him.

Reasons for Using Agency

"A year ago," said Mr. DeHaan, "I was making my own ads or using those provided by manufacturers, but I felt I was not getting sufficient returns. It was then I decided to employ a local advertising agency to handle my work for me. I did this for three reasons:

"1) I didn't feel I was getting full value for the money I spent on advertising.

"2) The time required for me to handle the advertising was an added cost.

"3) I lacked the experience necessary to produce effective ads."

Continuous Ad Program

Today, he has a continuous advertising program which provides for the publishing of a two-color quarter-page newspaper ad on the first Tuesday of each month. On the second, third and fourth Tuesdays of the month, one eighth-page two color ads are used.

The entire job is handled by the local advertising agency, which prepares a proof of the ad, submits it to Mr. DeHaan for approval and, when approved, takes care of all the details in placing the advertisements.

Ways to Reach Prospects

These ads cost approximately $350 a month. The agency receives a standard commission of 15 percent. Tuesday was selected by the agency as the most effective day to reach prospects for heating and air conditioning in Kalamazoo because on this day newspapers seldom contain large grocery ads.

The agency developed a symbol to represent the company, and a slogan that is used throughout the advertising program. The slogan "You can depend on DeHaan" is an easy one for prospects to remember. It also helps in playing up the company name which is one of the important features of an advertising program.

Ads are published in two colors — red and black — with adequate white space used to set off the illustrations in the ads.

DeHaan Heating is a member of the Kalamazoo Silver Shield Comfort Bureau and frequently

uses the Silver Shield symbol in its advertising.

Each advertising message tells prospects how they can enjoy better comfort with new equipment that's designed to provide comfort. The ad also explains that easy payments can be arranged to match the customer's ability to pay.

Advantages of Ad Agency

Don Rice, who heads the advertising agency, explained what advantages a dealer-contractor can expect by assigning his advertising to a specialist. "Most dealer-contractors have little knowledge of advertising or how to make it effective," said Rice. "Even for those that do, it takes their time, and this time is worth money. The dealer-contractor's own hourly rate is not as cheap as the time he can buy from an advertising agency. The buying, selling, supervision, personnel problems, inventory problems, complaints and the hundreds of other problems that must be handled each week in addition to the advertising leaves the dealer-contractor little time to apply to this subject.

"If an advertisement is only 50 percent as effective as it could be, this means it is twice as expensive as a good advertisement.

"Some dealer-contractors like to turn their advertising work over to the local newspaper advertising department. This arrangement doesn't always prove practical because the people working in such departments do not always know or understand the dealer-contractor's industry and therefore are not in a position to prepare effective advertising copy. Besides, they are usually heavily burdened with many other advertising accounts so they have very litle time to spend on planning an effective advertisement.

"I firmly believe a small local advertising agency can do a splendid job for the dealer-contractor. This belief is based on several surveys conducted on newspaper advertising which have shown that the difference between poor ads and effective ones can be as high as 1700 percent. This indicates that a poor newspaper advertisement is just money thrown away.

"An advertising agency might charge the dealer-contractor between 15 and 25 percent of his total budget to handle his advertising, but by merely doubling its effectiveness, the dealer gets 100 percent better results."

RECEIPT of new advertising proof that local ad agency prepared, from newspaper calls for a discussion between John G. DeHaan (left) John J. DeHaan

Role Advertising Plays

In pointing out why he believes in local advertising, Mr. DeHaan said that he thinks advertising can:

1) Build a company name that creates consumer acceptance and consumer demand.

2) Introduce new improvements and new products handled as quickly as possible to prospective customers.

3) Create an image of his company that is valuable in attracting good personnel as employees and contribute to good public relations.

4) Be part of the selling job that closes the gap between offering his product and service for sale and getting a signature on a contract.

He does not expect advertising to:

1) Produce precise results.

2) Reduce the need for personal contact with prospects and customers.

Mr. DeHaan believes that advertising is an effective way to introduce his company and employees to prospects. He feels that advertising is the door opener to a sale, that the basic work of reaching and creating interest can be accomplished at less cost by well directed advertising and that the follow-up, presentation and closing steps of a sale can be more quickly achieved because of advertising.

"Zephyr"-25 "Zephyr"-50

New "Zephyr" containers for "Freon" —lighter in weight, easier to handle

These new "Zephyr" containers for "Freon" refrigerants are shorter, wider, lighter—so much easier to handle that a 50-lb. size is now practical. You can use them upright or inverted without special blocks or stands . . . stack them one on top of the other . . . stand them upright in your truck.

A permanent collar not only protects the valve, but also serves as a built-in carrying handle. And no wrenches are needed, because these new containers also have a new-type handwheel valve. Both "Freon-12" and "Freon-22", the premium-quality refrigerants, are available in these new Du Pont "Zephyr" containers.

New top and valve for standard 25-lb. cylinders

Now, Du Pont's new "Spintop", for standard 25-lb. cylinders, combines a convenient carrying handle, valve protector and stand, all in one. Free to rotate, the "Spintop" provides easy access to the valve. And the valve itself is a handwheel type that includes a special, spring-loaded pressure relief valve for added safety.

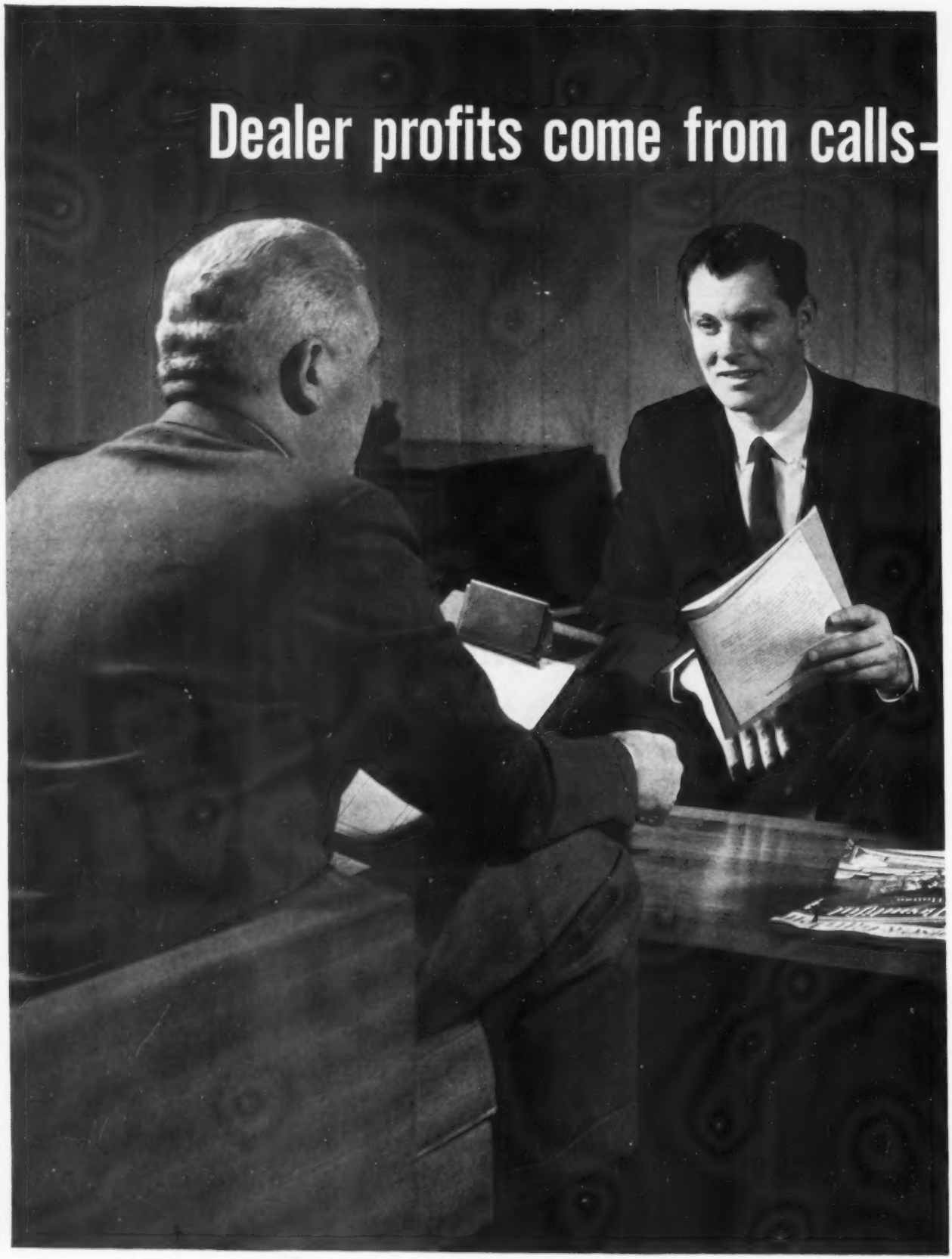
Complete family of containers* for "Freon" refrigerants includes the new "Zephyr" types; standard 10, 25 and 145-lb. containers; and the new "Spintop" cylinder. Your *leading* air-conditioning and refrigeration wholesaler stocks the type that suits your needs best. Call him today for your order of "Freon" refrigerants.

**1- or 2-lb. "Can-O-Gas" containers of "Freon" refrigerants are available from the Virginia Smelting Co., our nationwide sales agent and authorized repackager.*

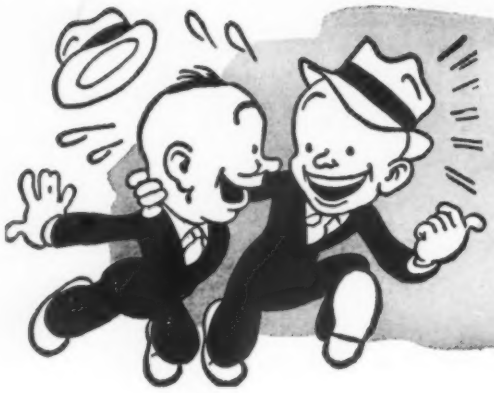
DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

FREON®
premium quality
refrigerants


Dealer profits come from calls-


-not call-backs!
It's surprising what heating and air conditioning manufacturers can learn when they're willing to roll up their sleeves and work side by side with the most important man in the business: you, the dealer.
Close Lennox cooperation in the field resulted in the finest sales and service schools in the industry. This policy enables *your salesmen* to share experiences . . . improve their selling techniques . . . learn to close more sales, faster. And your installers become more expert in making installations right the *first* time (without profit bleeding follow-up calls and make-over work).
If this partner-like relationship has been missing from your operation—it's time to call your nearest Lennox factory for the eye-opening story.
LENNOX
World leader in indoor comfort for home, business, schools
Lennox Industries Inc. founded 1895 • Marshalltown, Iowa • Columbus, Ohio • Syracuse, N.Y. • Fort Worth, Texas • Salt Lake City, Utah • Decatur, Ga. • Los Angeles, Calif. • Des Moines, Iowa • Lennox Industries (Canada) Ltd. • Toronto, Montreal, Calgary and Vancouver



Idea Exchange

for

Dealers, Contractors

Corrective Measures That Help To Eliminate Indoor Sweating

When water vapor from all sources are released in an unvented room, excessive condensation on walls and windows would be expected whenever the interior surfaces are cooled to the dew point

PROBLEMS RESULTING from an excess of moisture in a house can be as perplexing as those created when there is a deficiency of moisture, according to C. T. Baker, Mechanical Consulting Engineer of Atlanta. Sources of excess moisture can usually be traced to improper installation of household appliances. Recently I was commissioned by a home builder to determine the cause of numerous complaints he had received from homeowners of a newly completed housing development.

Sources of Moisture

Investigation revealed the following:

1) No kitchen ventilation

2) Unvented clothes drier

3) Automatic washing machine that discharged into set tubs causing considerable splashing

MOLD on walls is caused by excessive moisture in a house over a prolonged period of time

4) No bathroom ventilation

5) Each family had between 2 and 4 small children

Families with small children require considerable bathing, washing, drying and cooking. These activities result in the release of much moisture which is absorbed by furniture, walls, carpeting, etc.

When the dewpoint temperature of windows and walls is lowered during cold weather, moisture will collect on the cold surfaces, resulting in sweating walls with resultant damage.

Corrective Measures

Correction of this complaint was accomplished when kitchen and bathroom exhaust fans were installed, using capped roof ventilators; a fresh air intake connected from the outside wall to the return air side of the furnace; a vent connected from the laundry drier to the outside of the building; the automatic washer discharge connected to the sewer drain in such a manner as to prevent splashing; and a fresh air duct with a small electric heater in it to supply air for combustion purposes.

Where did all those DUSTGARD® Filters go?

They've been sold, of course. Customers buy them before all others because they look as clean as they make the air.

The Heating Season's Almost Here! Find Out, Now, How Profitable a Dustgard Distributorship Can Be!

DUSTGARD Air Filters gather dust only where you want them to—in your customer's furnace, not in your inventory. Your filter sales (and profits) will soar when you carry clean, white DUSTGARD Filters because they're backed by UNITED STATES GYPSUM—a name your customers know and trust. U.S.G. will back you, too, with the solid selling support of counter displays, mailing pieces, and product literature.

Write today for more information ----------

UNITED STATES GYPSUM

the greatest name in building

UNITED STATES GYPSUM

United States Gypsum, AA-01
300 West Adams St., Chicago 6, Ill.

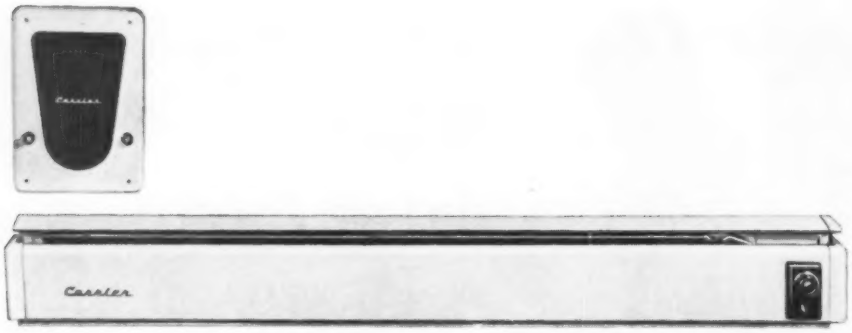
Gentlemen: I'd like to hear more about the full DUSTGARD Filter line. Please send me information on how I can become a DUSTGARD distributor.

Name_____

Company_____

Address_____

City_____ Zone____ State_____



CARRIER ELECTRIC HEATERS

More and more homeowners are asking for electric heating—and Carrier provides the best answer in a complete line of baseboard panels and wall inserts for any new home construction or remodeling job. No matter what the size and shape of the space, there's the ideal solution in the Carrier line. Baseboard panels available in two models (one with optional built-in thermostat) in capacities that range from 341 to 4265 Btuh. Fan-driven wall inserts also available in two models, with capacities ranging from 2559 to 13,648 Btuh.

ONLY A CARRIER DEALER HAS EVERYTHING

for residential heating!

CARRIER AIR PURIFIER

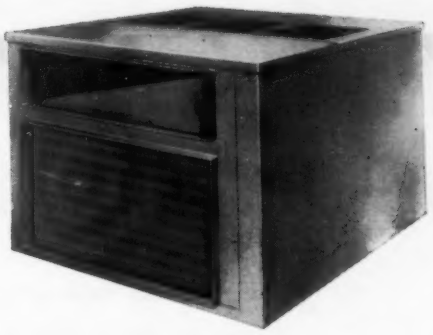
Latest product of Carrier research, this sensational new unit cleans the air and humidifies in winter. Through a unique self-cleaning process, it filters the air of odors, removes pollen and other harmful elements. Easily attached to a forced air furnace or air conditioning system. The newest Carrier exclusive for Carrier dealers!

BETTER AIR CONDITIONING FOR EVERYBODY EVERYWHERE

Carrier

CARRIER CLIMATE CENTER

Another Carrier first! Dramatic Climate Center enables the homeowner to tell his weather at a glance, dial the climate he likes best, also make sure his air conditioning system is operating efficiently and economically. All this from an 8 x 14 inch satin aluminum panel that installs easily between the studs in any room. An exclusive for Carrier dealers!



CARRIER HEAT PUMP WEATHERMAKERS

The line is complete from ½ ton to 10 tons. It includes a Portable for a single room, one-piece units for smaller homes and two-piece models for larger homes. The larger Carrier Heat Pump Weathermaker* models feature "Climate Balanced Design," which provides maximum working efficiency over the entire range of year-round temperatures.

Whether it's gas, oil or electric heat, only a Carrier dealer blankets the residential field with a complete line of models for every need.

Completeness of line, however, is only part of the picture. A Carrier dealer also has a steady stream of new products to offer—products that lead the field in technical developments. Latest example: the Air Purifier!

What's more, Carrier backs its dealers with everything to build greater volume—engineering help on difficult jobs, training in modern techniques, special credit on inventory, liberal financing help, promotional help—many more.

Some of the residential heating products are shown here. There are many more. And there is also a complete line of Carrier residential air conditioners—as well as complete lines for both commercial heating and air conditioning. No wonder the Carrier franchise is the most valued in the industry! Interested? For information, call the Carrier distributor listed in the Yellow Pages. Or write Carrier Corporation, Syracuse 1, New York.

CARRIER GAS AND OIL FURNACES

Carrier Winter Weathermakers are designed from the ground up as "Furnaces with a Future"—for the easy addition of summer cooling at a later date. The casing is amply wide for cooling air flow. All models are approved for .5-inch static pressure. Installs easily in utility room or closet near living areas. Extremely quiet because the new Carrier Floating Blower Mount suspends motor and blower inside the blower housing, eliminating vibrations. Four models: upflow, downflow, loboy and horizontal. Gas-fired bonnet capacities: 56,000 to 160,000 Btuh. Oil-fired: 84,000 to 185,000 Btuh.

*Reg. U.S. Pat. Off.

YOU AND THE LAW

Manufacturer Is Liable for Defective Equipment

The general rule of manufacturer nonliability no longer exists in cases where a customer suffers from defects in new or used equipment

LIABILITY imposed by the law on the manufacturer of air conditioning or warm air heating equipment for damages the customer of a retail dealer or contractor may suffer from defects in manufacturer has increased in recent years.

Not long ago a lawsuit came for decision before the Supreme Court of a northeastern state. It had been brought by a purchaser against the manufacturer of equipment for injuries he had suffered from defects in the manufacture of the articles. No contract had been made by the customer of the dealer-contractor with the manufacturer and consequently there were no representations or warranties.

Liability of Manufacturer

In its decision sustaining the right of the customer to collect his damages from the manufacturer, the court said, "One who supplies movable equipment (chattel) directly or through a third person for another to use, is liable to those whom the supplier should expect to use the equipment. This includes bodily harm caused by the use of the equipment if the supplier (a) knows, or from facts known to him, should realize that the equipment is, or is likely to be dangerous for the use for which it is supplied; (b) and has no reason to believe that those for whose use the equipment is supplied will realize its dangerous condition and (c) fails to excercise reasonable care to inform them of its dangerous condition or the facts which make it likely to be so."

Law Covers Used Equipment

A few years before this decision, that holds a manufacturer liable for damages irrespective of whether or not the sale had been made by it directly to the customer or through an intermediate dealer or contractor, the Supreme Court rendered a decision that dealt with injuries incurred in the use of second hand equipment.

In this case the manufacturer based his defense on the fact that the equipment was second hand. "With this contention," said the court in its decision against the manufacturer, "we cannot agree. The equipment in question was a durable product, made to last, a fact of common knowledge, as is the fact that such appliances are sold second hand and continue to give years of useful, safe service to other purchasers."

Base Decision on Danger of Defect

The court added, "The true test was and always has been, how dangerous is the defect of the equipment? The test is not whether the article is dangerous when carefully constructed, but whether it is likely to cause serious harm if carelessly made.

"Liability should be based upon what the article is, not on what it would be if perfect, in line with the general principle that negligence is the failure to exercise due care according to the existing circumstances."

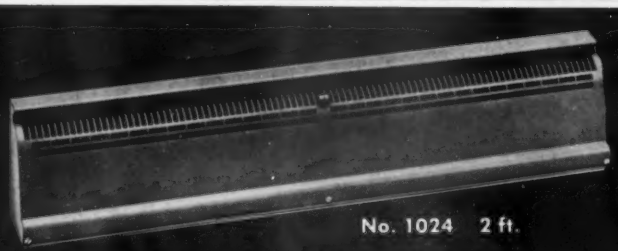
Adoption of this principle makes the manufacturer liable for the injuries to the property or person of those who have acquired equipment. A decision of a court in an eastern state imposed damages on a manufacturer of automobiles for injuries from a defective wheel incurred by one who had purchased the car from a local dealer. The customer, in this case, had no transactions whatever with the manufacturer.

Court Defines Danger

"If the nature of a thing is such that it is reasonably certain to place life and limb in peril when negligently made," said the court in this famous decision, "it is then a thing of danger. Its nature gives warning of the consequences to be expected.

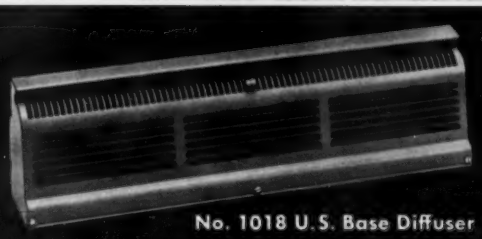
"If to the element of danger there is knowledge that the thing will be used by persons other than the purchaser and used without new tests, then, irrespective of the contract, the manufacturer of this thing of danger is under a duty to make it carefully. There must be knowledge of a danger, not merely possible but probable."

GET AHEAD – STAY AHEAD
with U.S. PERIMETER DIFFUSERS
BASEBOARD
SIDEWALL and
FLOOR STYLES



No. 1024 2 ft.

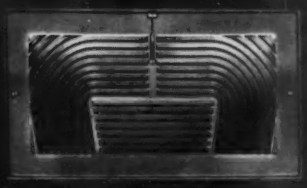
Recently improved, by adding additional oblong openings, U.S. No. 1000 Diffusers now lead the field in free area, beauty, and power. Base, for the Finer Perimeter Systems.



No. 1018 U.S. Base Diffuser

When you're on a project where Capacity, Compactness, and Diffusion with economy are more important than the Distribution of Air Flow, the No. 1018 U.S. Base Diffuser will assist in securing the Contract. It's only 18" long.

DIFFUSES A FULL SUNBURST PATTERN—A COMPLETE 180° OF EVEN AIR-FLOW AT EVERY DEGREE OF DIFFUSION

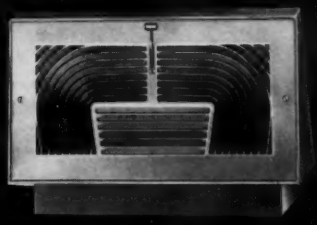


No. 105 U.S. DIFFUSER SIDEWALL REGISTER

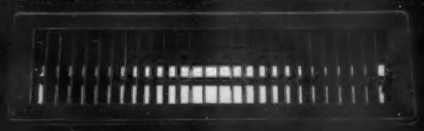
U.S. Pat. No. 176,926—SINGLE VALVE COMPLETE WITH SET-LOCK—THREE SIZES

No. 106 U.S. DIFFUSER BASE REGISTER

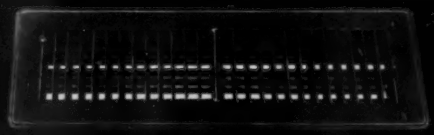
U.S. Pat. No. 176,926—COMPLETE WITH HEAD (Single Valve) WITH SET-LOCK



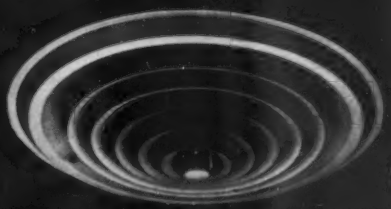
TWO NEW LINES of U.S.—Heavy-Duty, and STAMPED FLOOR DIFFUSER For Projects



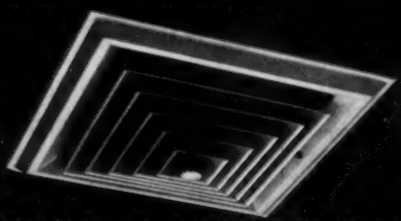
No. 410 U.S. DIFFUSER FLOOR REGISTER – QUALITY LINE – The Very BEST of ALL Floor Diffusers.



No. 413 U.S. StampAire FLOOR DIFFUSER STAMPED FACE – The BEST PROJECT ECONOMY LINE – The FINEST of ALL LOW COST Floor Diffusers.



Nos. 1500 and 2500 QUALITY and PRICE CANNOT Be EQUALLED By COMPETITION TRY THEM—BE CONVINCED



No. 1500 U.S. ROUND CEILING DIFFUSER

No. 2500 U.S. SQUARE CEILING DIFFUSER

INDOOR COMFORT

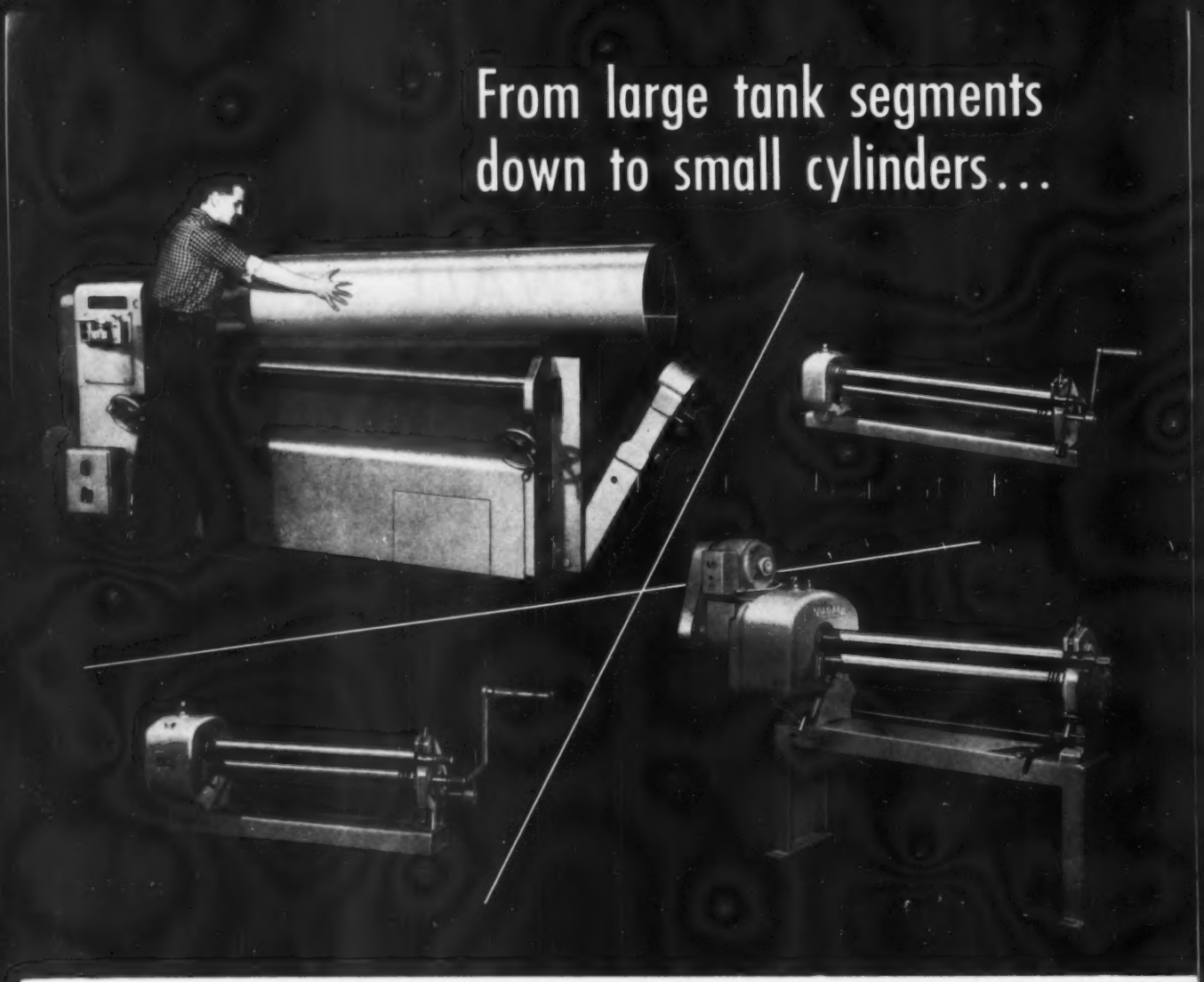
Be sure to get your A catalog for '60 just off the press

NRAIA

UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY



Niagara Slip Roll Formers can turn out better work faster, at greater profit

Name the job! In the truly complete Niagara line . . . *most complete of them all* . . . you're sure to find the Slip Roll Former best suited to your sheet rolling needs. Working with lengths up to 120" and thicknesses up to 5/16" mild steel, Niagara Slip Roll Forming Machines are available in an unusually wide range of power and hand operated models for forming light and heavy pipe; stacks; drum, pail, tub and other container bodies.

Featuring Pinch Type Rolls, modern Niagara Slip Roll Forming Machines produce commercially true cylinders virtually free from flat spots, using thin materials as well as thick . . . and because of Niagara's unique slip roll features, completed cylinders can be removed easily and quickly without distortion, saving time and costs.

Find out how Niagara Slip Roll Formers (Series 6", 4", 3", 2", 1½" and 1") can turn out better work at greater profits for you. Write for Niagara's new, illustrated Bulletin 77 today. It will be mailed free . . . without obligation.

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NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

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Distributors in principal U. S. cities and major foreign countries

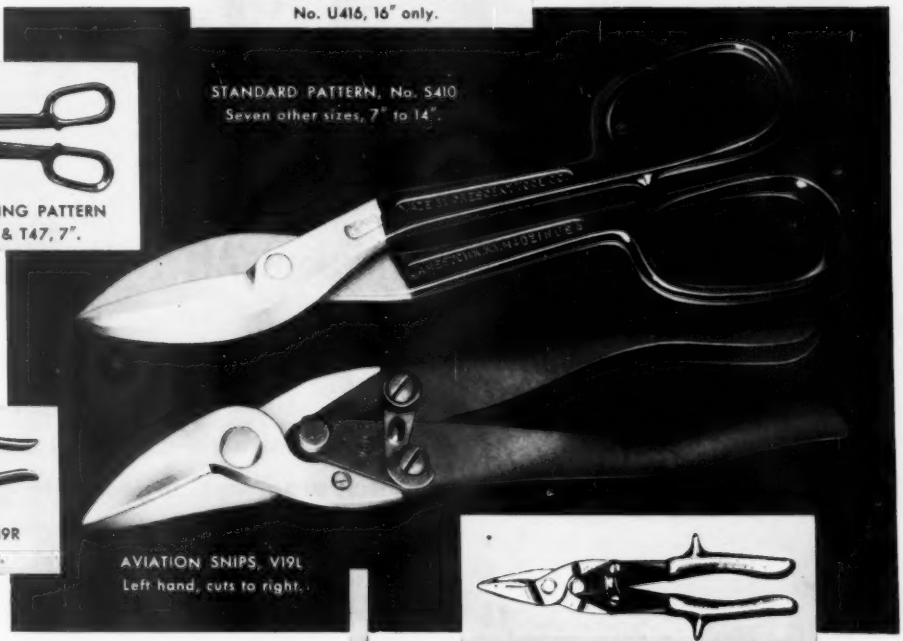
America's Most Complete Line of Presses, Shears, Other Machines and Tools for Plate and Sheet Metal Work

COMBINATION PATTERN
No. U412, 12" only.

SNIPS FOR EVERY SERVICE

HEAVY DUTY PATTERN
No. U416, 16" only.

CIRCULAR CUTTING PATTERN
No. T412, 12" & T47, 7".



STANDARD PATTERN, No. S410
Seven other sizes, 7" to 14".

AVIATION SNIPS, No. V19R
Right Hand, Cuts to left.

AVIATION SNIPS, V19L
Left hand, cuts to right.

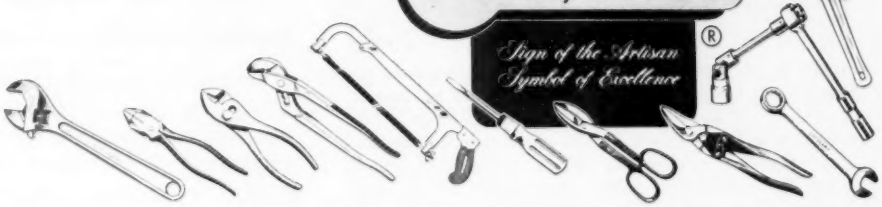
NEOPRENE INSULATING SLEEVES
Available for all Aviation Snips. Here shown on No. V19S, straight cut.

Crescent Tinners' Snips are forged of selected steel and blades ground on special grinding machines. They are hardened by Crescent's own selective induction process to insure long, satisfactory service. These easy-cutting, well-balanced snips are made in four patterns; standard, circular cutting, combination and heavy duty.

Sold by hardware dealers and industrial distributors everywhere.

AVIATION SNIPS. Keenly ground, hard, tough alloy steel blades with machine serrations...can be factory reground. Compound leverage produces tremendous shearing power. Three patterns.

CRESCENT TOOLS
Give Wings to Work
Sign of the Artisan
Symbol of Excellence



Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by

CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

WHAT ASSOCIATIONS ARE DOING

NEW OFFICERS heading the Georgia association are: (l to r) B. L. Noblitt, executive secretary; Wendell Townsend, treasurer; John A. Lance Jr., president; James M. Brown, vice president; and John R Tufts, past president

How Will Changing Conditions Affect Your Business?

. . . panelists ask Georgia sheet metal contractors. Speaker discusses successful sheet metal promotion programs, urges contractors to publicize their products and services

HOW TO COMPLY with the State of Georgia's new income tax withholding law was described by Joseph A. Jordon, Chief of Office Operations, Income Tax Unit, State Department of Revenue. Mr. Jordon advised the audience to file all forms and make payments of withholding taxes promptly to avoid strict penalties included in the law which became effective May 1, 1960

CHANGING BUSINESS CONDITIONS and how they affect the sheet metal contracting industry was one of the subjects discussed by delegates attending the summer convention of the Sheet Metal, Roofing, Heating and Air Conditioning Contractors Association of Georgia held at Jekyll Island, Ga. Panelist Clyde M. Barnes, editor, American Artisan, discussed national trends noted in organizational changes taking place, specific application uses for various types of sheet metal, growth of plastic materials, new sheet metal fabricating tools, and new uses of standard sheet metal tools.

Prospects Respond to Promotion

In commenting on the changes in organizational planning at the sheet metal contracting level, Mr. Barnes pointed out that both the retail public and people engaged in business management are being strongly influenced by what they read and see. He outlined the successful efforts of a Cincinnati sheet

(*Continued on page 87*)

"We're Closing 7 out of 10 Premium Sales..."

reports
MR. RON ECKLES, *Sales Manager*
C & H Home Service
Des Moines, Iowa

...with the

Permaglas® Magic-Heet STORY!

This impressive device, available to all Permaglas warm air heating dealers, enables Ron Eckles to simulate the actual operation of a Permaglas winter air conditioner with Magic-Heet. The gas flame is automatically lowered as the heat-sensing element is warmed in Mr. Eckles' hand . . . rises again as the bulb is allowed to cool. The Magic-Heet demonstrator (equipped with a handy carrying case) is compact enough to be taken into customers' homes, and includes blower, thermostat, controls and other operative components.

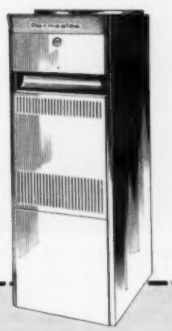
"As a *Permaglas* heating dealer, we're able to offer our customers a great big *plus* when it comes to comfort," says Ron Eckles, "but comfort can be a pretty hard thing to describe . . . much less prove. That's where our 'old reliable' *Magic-Heet demonstrator* takes over."

And how it takes over! Since taking on the *Permaglas* line and building their sales presentation around the Magic-Heet demonstrator, Ron Eckles and his crew have been signing up 7 out of every 10 prospects. Even last January (normally a slow month), C & H sold 18 *Permaglas* installations . . . every one a replacement and every one at full profit. "About the only thing our Magic-Heet demonstrator *won't* do," declares Ron Eckles, "is sign the order."

Magic-Heet, of course, is A. O. Smith's exclusive method of assuring uniform indoor temperature and near-continuous air circulation by actually "tuning" the flame higher or lower in response to constantly changing heat losses. As an important consumer benefit, Magic-Heet puts *Permaglas* winter air conditioners in a class by themselves. As a valuable selling feature that can be easily and dramatically demonstrated, it's unbeatable.

You, too, can turn lookers into buyers . . . convert price-shoppers into quality-conscious customers . . . when you make *Permaglas your* profit line for the '60s. See your nearest *Permaglas* Distributor or return the attached coupon without delay.

Permaglas gas-fired winter air conditioners are available in a full range of sizes and styles . . . Hi-Boy, Lo-Boy and Down-Flow. Magic-Heet is optional with all models . . . for use with all gases, including LP.



Through research ...a better way

A.O.Smith
CORPORATION

PERMAGLAS DIVISION
KANKAKEE, ILLINOIS • NEWARK, CALIFORNIA
A. O. Smith International S.A., Milwaukee 1, Wis.

A. O. SMITH CORPORATION
Permaglas Division, Dept. AA-760
Kankakee, Illinois

Gentlemen: Please send me full information on Permaglas gas-fired winter air conditioners with Magic-Heet.

Name.....

Company.....

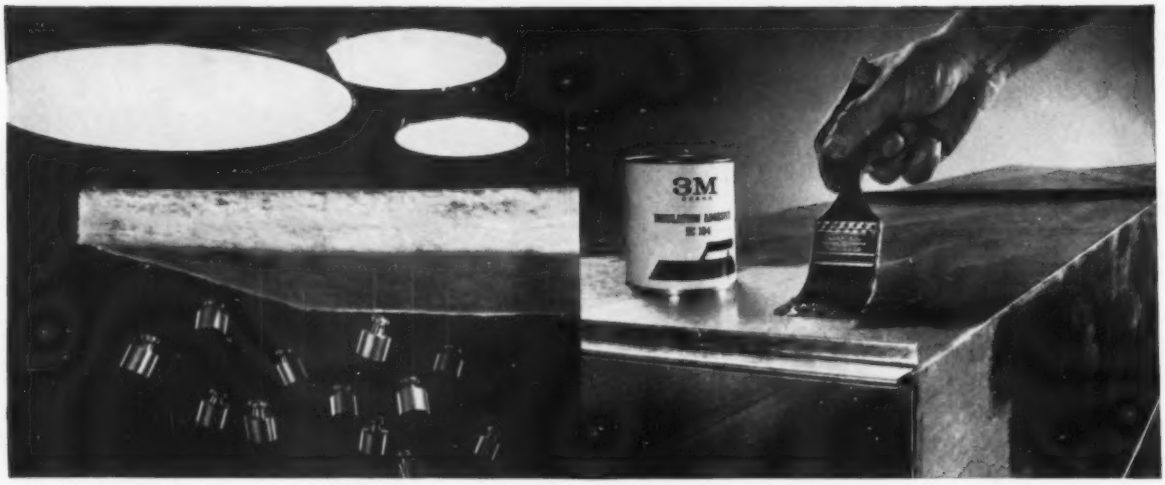
Type of Operation: ☐ Heating Contractor ☐ Heating Wholesaler ☐ LP Gas Dealer ☐ Other (specify).....

Address.....

City.....Zone.....State.....

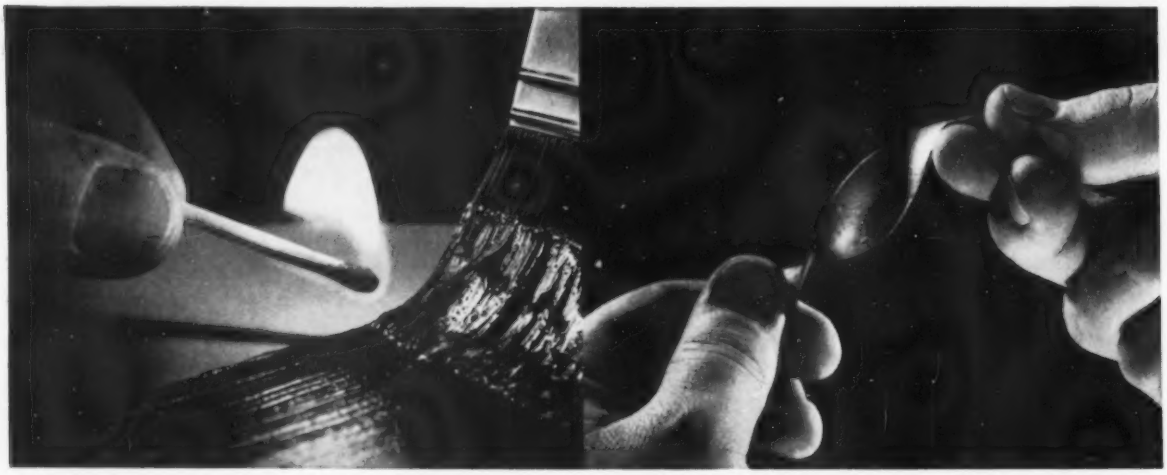
makers of famous **Permaglas®** *glass-lined water heaters...* **Burkay®** *commercial water heaters*

There's a 3M Brand Adhesive or Sealer for every insulation need!



High heat resistance! Adhesive EC-1128 holds tight despite temperatures as high as 300°F; resists moisture so that steam can't loosen the bond. Even keeps its grip at —20°F. And EC-1128 provides both instant grip and long open time to let you do the job right! EC-1128 bonds foil-to-foil lapped seams, too.

Good coverage! Adhesive EC-104 provides unusually high coverage . . . quickly and easily . . . for greater economy. One pint covers up to 25 square feet when brushed on. If spray-applied, one pint covers 44 square feet. EC-104 gives you fast grip even when wet. And still . . . you get the convenience of long open time.



Nonflammability! Solvent-free Adhesive EC-321 won't burn during application—even near an open flame. You can apply insulation anywhere without fear of fire. EC-321 supplies a durable bond that resists high heat, moisture and vibration. It even bonds through thin oil films. Roll, brush or spray it on!

High velocity systems! Flexible Sealer EC-800 can be stretched twice its length before fracturing. It sets up firmly at duct joints, won't flow out of seams under pressure, yet it flexes with duct expansion and contraction. Actually adds structural strength to duct work. Apply with brush, flow gun or putty knife.

SEE WHAT 3M ADHESIVES CAN DO FOR YOU—Contact your 3M Field Engineer. Or, for more information and free literature telling how time-tested 3M Brand Insulation Adhesives and Sealers can help solve virtually all your insulation problems, write on your company letterhead to: A., C. & S. Division, 3M, Dept. SBJ-70, 900 Bush Avenue, St. Paul 6, Minnesota.

ADHESIVES, COATINGS AND SEALERS DIVISION

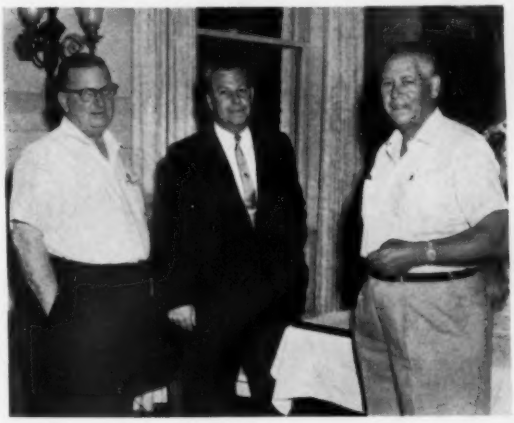
MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

WITH THE ASSOCIATIONS

(Continued from page 84)



INSURANCE FOR THE SHEET METAL CONTRACTOR was outlined by William T. Williams, member of executive committee of the Georgia Association of Independent Insurance Agents. Mr. Williams advised sheet metal contractors to watch out for contracts offered by general contractors where the statement "In accordance with . . ." appears. Before signing contracts containing this clause, he suggested, contractors should have the contract checked by either (or both) an attorney or insurance agent. Delegates Charles W. Bryan Jr. (left) and Aaron Newman talked over specific cases with the speaker at end of session

metal contractor to promote his services through an attractive direct mail piece mailed at three-week intervals to all previous customers and to commercial and industrial companies located in the geographical area served by the sheet metal contracting firm.

Another sheet metal contractor who used a direct mail campaign to promote a specialty item he builds planned his program around a four-page, two-color brochure that describes and illustrates the product and shows several typical uses.

Both direct mail campaigns resulted in a number of non-competitive jobs.

Contractor Photographs His Work

A third example illustrating how sheet metal contractors have undertaken planned sales promotion programs was the use by a contractor of full page advertisements in a local chamber of commerce magazine. Each ad told a story, through the use of illustrations and brief text, about a recent installation or product fabricated by the contractor. This sheet metal contractor takes pictures of the various types of work passing through his shop and, through the medium of advertising, lets his customers and prospects know the extent and variety of his many services.

Check-Lists Uncover Non-Competitive Jobs

Three ready-made check-lists (for stores, hospitals and plants) were shown by Mr. Barnes, who explained how they could be used by sheet metal contractors to uncover non-competitive work. (Samples of these sales aids are available from American Artisan's editorial office.)

New officers elected are: John A. Lance, Atlanta, president; James M. Brown, Rome, vice president; and Wendell Townsend, Atlanta, treasurer. John R. Tufts, having completed his term as president, becomes past president, and will act as ex officio for the ensuing year. B. L. Noblitt remains as executive secretary.

Directors elected are: Joel A. Wier Jr., Athens; Charles A. Barnes, Atlanta; Melvin Kruger, Macon; and Hugh Jenkins, Savannah. Holdover directors are: Charles A. Sapp, Albany; R. L. Sanders, Atlanta; J. Marvin Kelly Jr., Augusta; L. D. Herndon, Columbus; and James H. Welch, Valdosta.

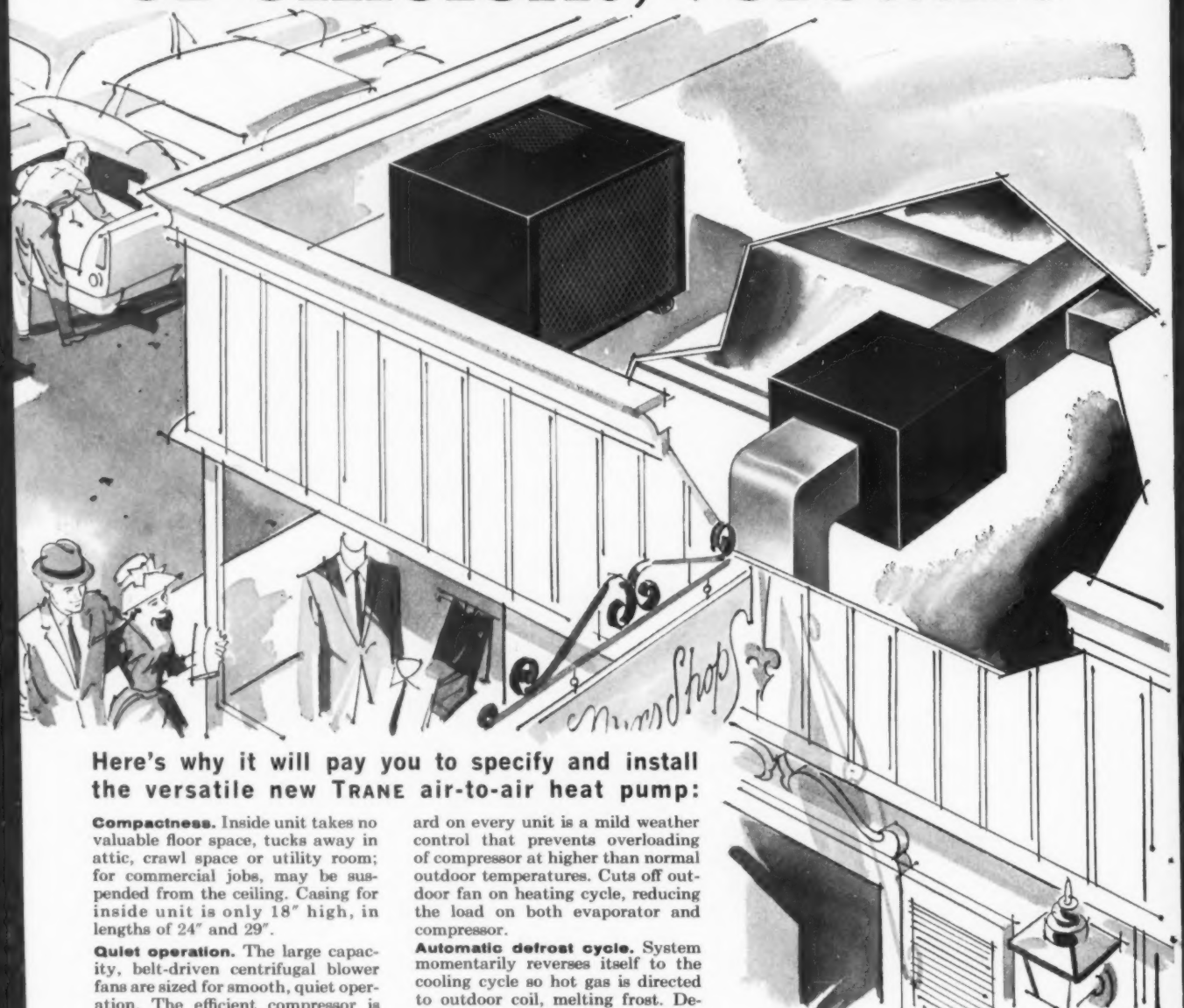
Rochester Honors Friday's 20 Years of Service

ROCHESTER, N. Y. — Twenty years as executive secretary without missing a meeting is the record of Richard W. Friday, who was honored by fellow members of the Sheet Metal, Furnace and Roofers' Association of Rochester. A standing ovation, congratulatory speeches and best wishes from individuals were some of the expressions of appreciation accorded Mr. Friday, who was originally elected secretary on January 28, 1940.

Among Mr. Friday's achievements during the past 20-plus years are these: He has attended over 360 consecutive meetings; mailed over 11,000 bulletins, letters and bills; made more than 2100 official telephone calls; and attended all 17 conventions of the Sheet Metal and Air Conditioning

(Continued on page 90)

Trane announces of efficient, versatile



Here's why it will pay you to specify and install the versatile new TRANE air-to-air heat pump:

Compactness. Inside unit takes no valuable floor space, tucks away in attic, crawl space or utility room; for commercial jobs, may be suspended from the ceiling. Casing for inside unit is only 18″ high, in lengths of 24″ and 29″.

Quiet operation. The large capacity, belt-driven centrifugal blower fans are sized for smooth, quiet operation. The efficient compressor is designed for heat pump duty—at outside temperatures as low as 0°.

New coil design. Exclusive TRANE Sigma-Flo Coils provide more coil surface and fin spacing. Coil in outside unit has wider fin spacing to minimize icing, to provide proper evaporative surface in heating season.

Built-in sub-cooling. The last two tubes in the condenser and evaporative coils function as a sub-cooling section. Provide added capacity, minimize possibility of liquid to gas flashing.

Simplified controls. Low voltage control package provided for easier wiring, superior operation, more accurate temperature control. Standard on every unit is a mild weather control that prevents overloading of compressor at higher than normal outdoor temperatures. Cuts off outdoor fan on heating cycle, reducing the load on both evaporator and compressor.

Automatic defrost cycle. System momentarily reverses itself to the cooling cycle so hot gas is directed to outdoor coil, melting frost. Defrosting accomplished automatically in 2 to 3 minutes.

Auxiliary heaters. Electric heater packages available for all TRANE inside (fan-coil) units. Furnished with control panel and thermostats. Provide necessary additional heat for extremely cold weather conditions.

Versatility. The air-to-air heat pump systems are available in 2, 3, 5 and 7½ hp capacities. Water-to-air heat pumps in 5 sizes: 3, 5, 7½, 10 and 15-ton units. Water-to-air heat pumps in same modern cabinet design as De Luxe Self-Contained Climate Changer shown at right. Electric auxiliary heaters come in 5, 10 and 15 KW sizes.

Cool stores, offices with a TRANE De Luxe Self-Contained Climate Changer. Air or water-cooled models in 3, 5, 7½, 10 and 15-ton capacities.

. . . a new line air-to-air heat pumps

Another quality addition to the TRANE packaged line; for commercial and residential jobs, in any climate!

Newest addition from the TRANE laboratory—"The House of Weather Magic"—is an air-to-air heat pump that's engineered with features that assure simplified installation, peak performance, no unnecessary callbacks! These new TRANE Heat Pumps are compact; they're versatile: designed for a wide variety of your commercial and residential jobs. Units are produced in the new, modern TRANE factory, built exclusively for the production of packaged equipment. This assures you of rigid quality control, high manufacturing standards, accurate ratings. And all components are produced together for use together—making possible the selection of perfectly matched units from one responsible source.

Read the detailed description of the new TRANE air-to-air heat pump on the opposite page. You'll see why it's your best choice for any job, commercial or residential!

Want more facts? It's easy to find out about all the advantages of becoming a TRANE Dealer for the complete line of packaged equipment. Just call your nearby TRANE Sales Office. Or write TRANE, La Crosse, Wisconsin.

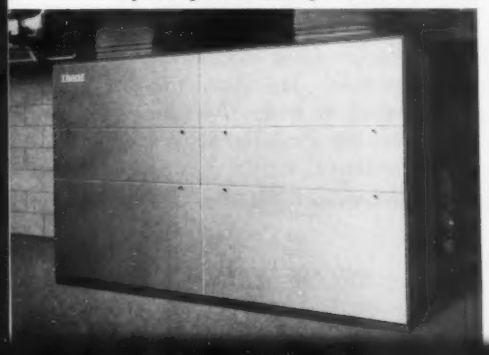
For any air condition, turn to

TRANE

MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

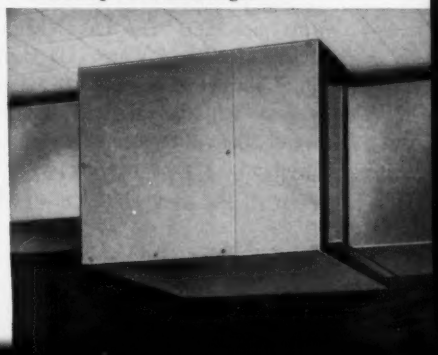
THE TRANE COMPANY, LA CROSSE, WIS. • SCRANTON MFG. DIV., SCRANTON, PA. • CLARKSVILLE MFG. DIV., CLARKSVILLE, TENN. • TRANE COMPANY OF CANADA, LIMITED, TORONTO • 100 U.S. AND 19 CANADIAN OFFICES

For larger jobs, make it a TRANE Commercial Self-Contained air conditioning unit. Air or water-cooled, 20 to 50 tons. Quiet operation, simplified installation.



Heat and cool with a TRANE Residential Climate Changer. Oil or gas-fired. Cooling unit may be added later—or installed with existing warm air furnace.

Separate cooling system. Fan-coil unit fits in attic, basement, utility room. Refrigeration unit, installed outside, features upward discharge.



(Continued from page 87)

Lake County Association Works On Consumer Education Program

EXCHANGING INFORMATION on how to combat local problems are (l to r) Howard Hochens, secretary, Lake County Sheet Metal Contractors Association; Ben Flock, president of the Indiana state association; John Wesbecher, Lake County treasurer; Arnold Henderlong, guest speaker; Alex Einikis, vice president and Ralph Potesta, executive secretary of the Lake County group; Roger McCoy, Glenn Nallinger, and Frank Putt

MEMBERS AND GUESTS of the Lake County Sheet Metal Contractors Association met recently to hear Ralph Potesta, executive secretary, explain what the association is doing to combat bad publicity created by several dealer-contractors in the area who are overcharging, making poor installations and using high pressure sales methods.

Mr. Potesta explained that the association had already started an advertising program that would continue for about six months in two local newspapers. He pointed out that the campaign is designed to educate the consumer on what he should expect from a system designed and installed by a reputable dealer-contractor, and editorials will be run that will inform the consumer of poor installation practices.

The first half page ad contained this message: "The Lake County Sheet Metal and Warm Air Heating Contractors Association, in order to help the consumer understand the difference between a good and a poor heating system, presents the accompanying standards." (These are the Standards for Rating Heating Systems published by American Artisan.)

This ad also contained a list of association members who could be contacted for reliable service.

Each ad will have an illustration of a decal that members will display in their trucks and shops. The association feels that even though the consumer might forget the name of a reliable dealer-contractor, he will remember the decal and associate it with dependable service.

Mr. Potesta feels this public relations program will create prestige for members of the association and stimulate others to join.

Electric Heat Talk Given at Detroit

DETROIT — Subject discussed at a recent meeting of the Detroit Heating and Air Conditioning Association was "The Electric Heating Market." Speakers, furnished by Emerson Electric Co., were E. K. Handlen, sales manager, and Charles Parker, district representative.

Secretary Honored For 20 Years' Service

(Continued from page 87)

Contractors' National Association, to which the Rochester membership belongs as a group.

The commemorating ceremonies provided the opportunity for members to recall many of the changes that have taken place during the past 20 years, for example:

1) Membership in 1940 totaled 15; attendance averaged 35 percent. Membership in 1960 totals 30; attendance averages 65 percent.

2) Dues of $5 a year in 1940 have been raised to $100.

3) Wages have risen three times the $1.20 per hr paid sheet metal workers in 1940.

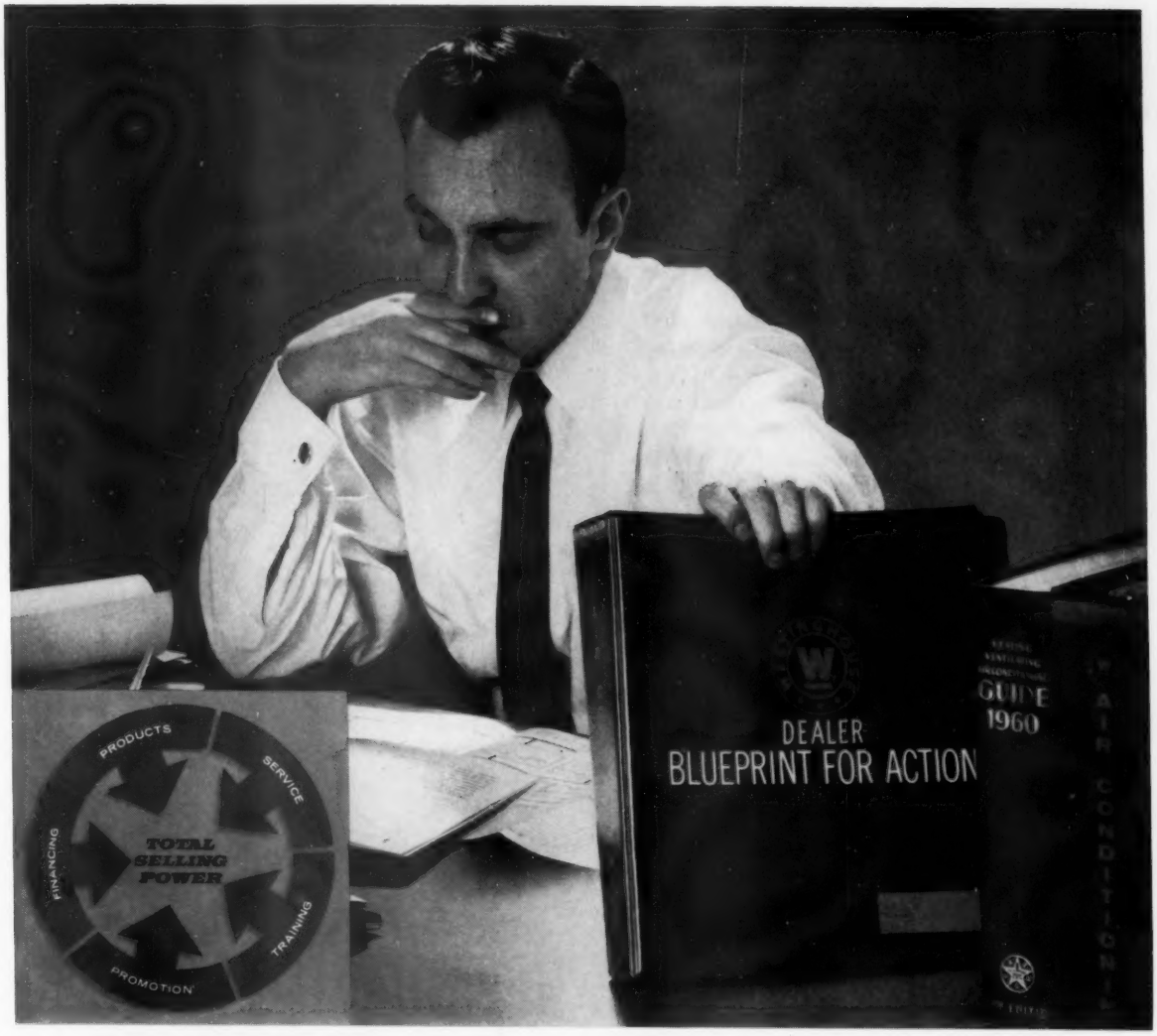
4) Wholesalers and other suppliers have joined committees, and better harmony exists because of clearer understanding of one another's problems.

Editors Note: We at American Artisan add our congratulations and best wishes to those already received by Mr. Friday for his unselfish devotion to his local, state and national associations and his untiring efforts to improve his industry.

Elect Kuharic At South Bend

SOUTH BEND, IND. — John Kuharic was recently elected president of the St. Joseph Valley Furnace & Sheet Metal Contractors' Association. Robert Melkey was elected vice president and Burton Walker treasurer. Jack Bennett is corresponding secretary for the association and Paul DeVoss recording secretary.

(Coming Events on page 92)



A PROMOTION PLAN

That Meets Total Selling Needs

Only Westinghouse Gives You Year-Round, Localized Heating and Cooling Programs with a 40 Million Dollar Back-Up!

Westinghouse "Blueprint for Action" gives you complete local promotion programs, suited to your way of doing business.

Packed with workable, salable ideas and promotions, this book helps you use local promotions effectively to increase sales. And you keep adding to this promotional stockpile with timely, specific promotions the year 'round, prepared for you by Westinghouse. In back of your local efforts is a $40,000,000 corporate advertising program, highlighted right now by complete radio-TV coverage of both presidential conventions. Throughout the year your customers are being sold on Westinghouse, which helps you in your daily selling efforts.

Local promotion is just one of the forces that work for you. Add a full line of heating and cooling *products*, complete *training* program, expert *service* facilities, realistic *financing* assistance, PLUS a powerful brand name —Westinghouse—for TOTAL SELLING POWER.

For more information, call your local Westinghouse representative or write: Don Meckstroth, Manager of Marketing, Air Conditioning Division, Westinghouse Electric Corporation, Staunton, Virginia. J-85042

YOU CAN BE SURE...IF IT'S **Westinghouse**

TUNE IN WESTINGHOUSE-CBS TV-RADIO COVERAGE
PRESIDENTIAL CONVENTIONS, JULY 10-29

(Continued from page 90)

Coming Events

July

July 21 — Chicago Warm Air Golf Association, golf outing. Itasca Country Club, Itasca, Ill. Albert Verbeek, Verbeek Heating, 353 E. Kensington Ave., Chicago 28.

September

Sept. 8 — Chicago Warm Air Golf Association, golf outing. Ruth Lake Country Club, Hinsdale, Ill. Albert Verbeek, Verbeek Heating, 353 E. Kensington Ave., Chicago.

October

Oct. 12-14 — American Gas Association, annual convention, Atlantic City, N. J. C. S. Stackpole, managing director, 420 Lexington Ave., New York 17.

November

Nov. 14-15 — National Warm Air Heating and Air Conditioning Association, annual convention. Statler-Hilton Hotel, Cleveland. J. M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

Nov. 16-17 — National Warm Air Heating and Air Conditioning Association, Board of Trustee meetings. Statler-Hilton Hotel, Cleveland. J. M. Martin, managing director, 640 Engineers Bldg., Cleveland 14.

Nov. 18-22 — Air-Conditioning and Refrigeration Institute, annual meeting. Hollywood Beach Hotel, Hollywood Beach, Fla. Geo. S. Jones Jr., managing director, 1346 Connecticut Ave., Washington 6, D. C.

Nov. 27-30 — Northamerican Heating & Air-conditioning Wholesalers, annual convention. Statler-Hilton Hotel, Detroit. Wilbur R. Bull, managing director, 1200 W. Fifth Ave., Columbus, O.

1961

February

Feb. 13-16 — American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., semi-annual meeting, Chicago. R. C. Cross, executive secretary, 234 Fifth Ave., New York.

Feb. 13-16 — International Heating & Air-Conditioning Exposition. International Amphitheatre, Chicago. E. K. Stevens, exposition manager. International Exposition Co., 480 Lexington Ave., New York 17.

April

Apr. 5-7 — Gas Appliance Manufacturers' Association, annual meeting. Boca Raton Hotel and Club, Boca Raton, Fla. Gas Appliance Manufacturers' Association, 60 E. 42nd St., New York 17.

Strong Elected President by Florida Group

LAKELAND, FLA. — M. J. Strong was unanimously elected president of the Roofing and Sheet Metal Contractors Association of Florida at the association's recent convention held in Orlando. Retiring president Eldon C. Goldman will serve as first vice president. Other new officers are David Hess, Jacksonville, second vice president; Forest Dean, Clearwater, third vice president; and J. W. Keen, Miami, secretary-treasurer.

Members of the association's board of directors are:

District 1 — Charles Farabee and Walter Anschuetz, St. Petersburg; and John Starr, Clearwater.

District 2 — Charles Stephens, Harold Broom Jr., George Ferber and Mack Fillingham, all of Jacksonville.

District 3 — Jack McCormack, Pensacola.

District 4 — Thomas D. Kemp, Hialeah; Wyley Shepherd and W. H. Condermann, Miami.

District 5 — Vernon Blank, Daytona Beach; Nels Frid, Winter Park; and J. Caldwell, Orlando.

District 6 — Victor P. Kinsey and Howard Carpenter, West Palm Beach.

District 7 — Howard Hill, Sarasota; Richard Lichenwalter, Winter Haven; and Bunk Floyd, Lake Wales.

District 8 — R. C. Tucker, Ocala; and J. Ferber, Gainesville.

"WE DEPEND ON WISS SNIPS TO HELP DO BIG JOBS FAST!"

says Milton Newman, Vice President of Eastern Sheet Metal Works, Inc., N.Y., N.Y.

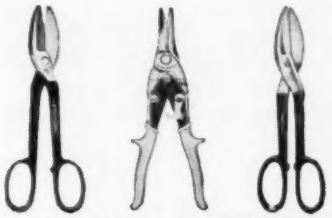
OVER 35 YEARS AND STILL SHARP Foreman Maxwell Schneider bought these Wiss Bulldog Snips over 35 years ago. They're as good as ever. Perform as well as any new snips in the shop.

"We prefabricate sheet metal ducts for air-conditioning and ventilating for some of the largest buildings in New York City. Some take four or five hundred thousand pounds of duct work. Most of the time it has to be done quickly. For instance, we fitted a 36 story skyscraper with air-conditioning ducts in six months.

"Nothing leaves our shop without exacting handwork being done on it. When you have to be fast and accurate you need the best snips you can buy. That's why you'll find Wiss Snips on our work benches.

"Our men choose their own hand tools . . . they do the work—they know what tools will do it best. And they all agree, there's nothing like Wiss Snips. They keep their cutting edge longer and they last. They pay for themselves time and time again."

Why not take a tip from the men at Eastern Sheet Metal. Next time you need snips, specify Wiss! Nothing cuts easier . . . stays sharper . . . lasts longer.



Inlaid ■ Metal-Master ■ Solid-Steel

WISS INLAID BLADE SNIPS cut with lasting sharpness, tremendous power. High carbon crucible steel blades, welded to hot drop-forged frames. Complete range of sizes, 11½" to 17". Models: straight cutting, circular cutting, curved blades, and bulldog notching.

WISS METAL-MASTER AVIATION SNIPS, with amazing compound action, cut with half the effort required by conventional snips! They are preferred by many for their compact size, and ability to make intricate cuts. Left, right and straight cutting models, only 9¾" long, cuts 18 gauge metal. Bulldog combination model, 9¼" long, cuts 16 gauge stainless steel!

WISS SOLID STEEL SNIPS, made from a special grade of solid tool steel, are available in straight cutting, circular cutting and bulldog models from 7" to 16". Priced slightly lower than inlaid snips.

WISS **...Made by Metal Craftsmen for use by Metal Craftsmen**

J. WISS & SONS CO., NEWARK 7, N. J.

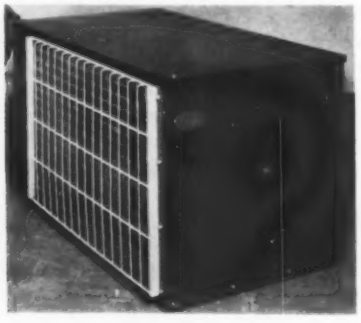
World's Largest Manufacturer of Shears, Scissors, Pinking Shears, Skalloping Shears, Metal Cutting Snips and Garden Shears

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For additional product information which is available, see this month's New Literature department

Remote Air Conditioner

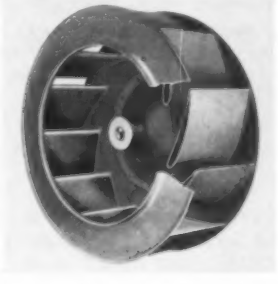
AR SERIES 5 remote air conditioner features an improved baked enamel weatherproof finish, crossbrake top panels, reinforced "zee" base bars, protective coil



grille, sight glass with moisture indicator, and refrigerant charge, according to the manufacturer. The models being offered in this series are 34,000 and 48,000 Btuh capacities—*The Payne Co., Box* 2222, *La-Puente, Calif.*

Centrifugal Fan

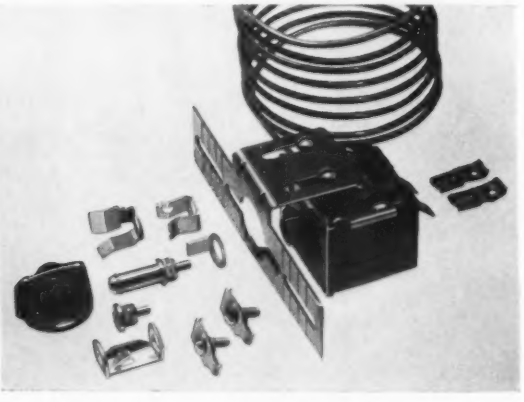
SERIES 116 line of airfoil bladed centrifugal fans are available in 15 sizes in both single and double inlet designs. According to the manufacturer, the fans are recommended for use in supply and exhaust systems



for ventilation and industrial processes; in air conditioning installations of conventional low velocity, high velocity or double-duct systems; in industrial air conditioning systems; in heavy duty industrial systems; and in ventilation of tunnels for vehicular, pedestrian and railroad traffic. Blades in the Series 116 wheels are double surface die-formed steel with airfoil cross section. The blades are continuously welded on the air leaving edge to the rim and to the hub plate—*American-Standard, Industrial Div., Detroit* 32.

Replacement AC Controls

A30 REPLACEMENTS include 23 basic controls and installation packages that enable servicemen to make on-the-job control replacements on service calls. According to the manufacturer, control mounting brack-



ets are designed to easily adjust to fit almost any application. The dial shaft extensions are adaptable to any desired length, and the capillary tubes can be shaped to any desired requirement with a capillary forming tool developed by the company—*Ranco Inc.,* 601 *West Fifth Ave., Columbus.*

Job Progress Board

VISUAL CONTROL BOARD adaptable to sheet metal contractors and heating-air conditioning dealer-contractors' use for listing of jobs in progress and current status of each. Job identification (number, name or address) is marked on $\frac{3}{4} \times 29\frac{3}{8}$ in. clear plastic strips with black grease pencil. When job is completed, grease pencil marks are removed with paper tissue or cloth and the strip removed from position on board and inserted at bottom for reuse. Markings by grease pencil are easily read, according to manufacturer, because of white vinyl background of laminated steel board. Memo strips are held in place by metal side guides. Bottom of memo board contains a shelf for variety of colored grease pencils. Column headings (and widths) are selected to individual company re-

only this much more

buys this much difference

The little extra you pay for Purolator filters buys features and performance you just don't get in ordinary filters. The picture shows you the difference; here's what this difference means to you:

❶ Nozzles last longer because the Purolator Micronic element filters out abrasive particles as small as 0.0005 of an inch. A waste-type filter medium, no matter how much it's compressed, simply can't filter that fine, even when it's new.

❷ Filters last longer (a year or more without servicing) because every Purolator filter has over 200 square inches of filtering surface, enough to filter over 7,000 gallons of fuel oil without replacement.

❸ No channeling or unloading, ever, because the Micronic element is precision made from a single pleated sheet of resin impregnated cellulose that resists water and acid, won't shrink, stretch, distort, flake or deteriorate.

❹ No spillage, no air leaks. The depressed head on the Purolator housing eliminates spillage when servicing. The recessed gasket seal makes an airtight fitting between case and head.

And because Purolator filters filter better, longer, you make fewer trips, have fewer problems fulfilling your service contract. For full information, write to Dept. 2577.

Filtration For Every Known Fluid

PUROLATOR

PRODUCTS, INC.

RAHWAY, NEW JERSEY AND TORONTO, ONTARIO, CANADA

quirements. Information such as: job name, job number, date sold, date started, 25 percent finished, etc. are determined by office staff. Column headings and

vertical column lines are formed by accompanying accessories. Models are available with or without fluorescent lighting at top. Each contains 50 plastic memo strips. Dimensions: 31½ in. wide, 38½ in. high—*Memo Flex*, 515 *Bannock St., Dayton* 4, *Ohio.*

Combination Stand And Carrier

HANDI-STAND provides servicemen who use Isotron refrigerants in 22 and 25 lb cylinders with a combination stand and hand carrier which replaces the plain protective cap and is a permanent part of the cylinder —*Pennsalt Chemicals Corp., Three Penn Center, Philadelphia* 2.

Aluminum Siding

VERTICAL aluminum siding was designed to harmonize in style and color with 8 in. clapboard siding, which this manufacturer introduced earlier this year.

It is available in dark green, light green, maroon, white, and grey. It features vertical trapezodial corrugations at 12 in. intervals. The vertical siding is coated with Alumalure baked enamel finish and is constructed of alclad aluminum sheet for corrosion resistance. Utilizing a conventional interlocking installation system, it will cover any type of surface permanently, including wood, stucco, shingle, and concrete block—*Aluminum Company of America*, 1501 *Alcoa Bldg., Pittsburgh* 19.

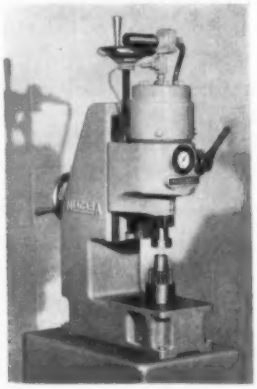
Horizontal Grille

SERIES 18H grille is made from a solid piece of 19 gage steel, and has curved ½ in. horizontal louvers that are spaced ½ in. apart. The louvers are deflected

30 deg to prevent see-through and, according to the manufacturer, are designed to perform efficiently with either upward or downward deflection. They can be installed on high or low sidewall, on ceiling, and in doors. Sizes range from 10 × 6 in. to 30 × 24 in. —*Lima Register Co.*, 1790 *N. Cable Rd., Lima, Ohio.*

Single-Acting Air Presses

TWENTY-EIGHT MODELS offer a wide selection for punching, swaging, staking, upsetting, and imprinting operations plus the seating and removal of close tolerance bearings and bushings. Four presses range



in sizes from ½ to 2 ton capacities at 85 psi, and the line includes a choice of 3 air and 3 electrical control systems. For specialized applications, electronic timers, speed control valves, and pressure limit controls are available. All models may be bench mounted or furnished with a floor stand of steel plate construc-

GAIN *More* SATISFIED CUSTOMERS WITH THE ADDED APPEAL OF *Quality-Assured* GM DELCO HEATING-COOLING

COMPACT, TOTALLY ENCASED UNITS adapt ideally to attractive closet installations, saving your customers valuable floor space.

A NATIONAL BRAND PRODUCT, advertised and distributed coast-to-coast is more readily accepted by your customers.

FACTORY TRAINING ON INSTALLATION AND SERVICE available for your personnel.

AN ENGINEERED LAYOUT SERVICE for your project applications that assures the most efficient size unit for every heating and cooling installation.

BACKED BY GENERAL MOTORS REPUTATION, a world-renowned name for quality products.

YOU HAVE MORE TO SELL with the complete line of Delco furnaces, boilers, water heaters and air conditioners. *You'll do better with Delco.*

GM DELCO HEATING COOLING
Product of General Motors

Take advantage of national brand product acceptance. Eliminate any uncertainty about the comfort of your customers in any climate by using GENERAL MOTORS-DELCO HEATING AND AIR CONDITIONING. Write, wire or phone for more details.

DELCO
APPLIANCE DIVISION
Rochester 1, New York

GENERAL MOTORS CORPORATION

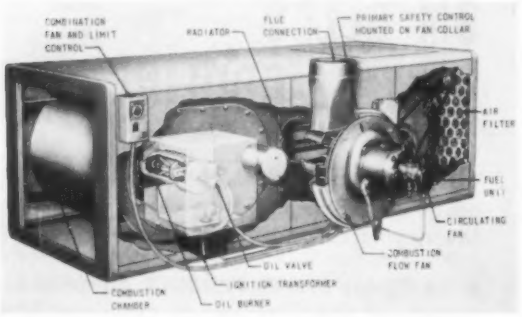
equipment developments

(Continued)

tion—*Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N.Y.*

Oil-Fired Furnace

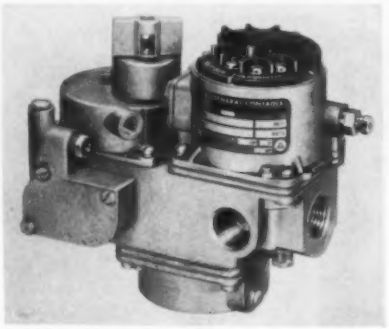
CUSTOM MARK 11 oil-fired furnace is now available in a horizontal form for use in homes and small commercial buildings. The furnace comes in six heating



capacities, with an output rating at the bonnet of from 84,000 to 250,000 Btuh. Designed for No. 2 oil, the furnace includes this standard equipment: Built-in oil burner with integral draft fan, two-stage fuel unit and solenoid oil valve; circulating fan and motor and safety stack switch; standard thermostat; combination fan and limit control; one to four filters, depending on the model; and all motors and controls are 115 volt, 60 cy., 1 ph—*Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, Ohio.*

Gas Control Valves

"VERSATROL" line of combination valves for use on forced air furnaces, floor furnaces, room and wall heaters, appliances, and other gas-fired equipment. It



consists of a basic body with main gas cock and manual reset safety shut-off valve. According to the manufacturer, when changing from one type of gas to another, it is unnecessary to remove or replace the en-

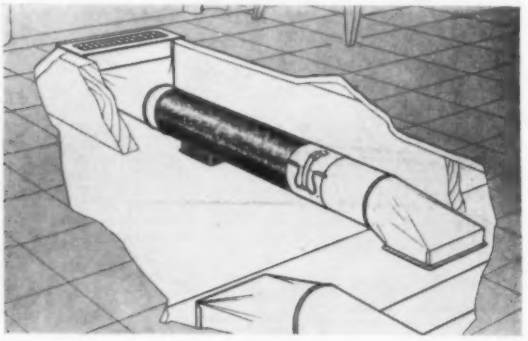
equipment developments

(Continued)

tire valve assembly, merely the operator and, if needed, the optional pressure regulator. Three types of thermostatically controlled operators are available. The self-energizing millivolt, 24/115-volt solenoid, or the silicone filled silent hydranoid type. They can be used for any gas application up to 180,000 Btuh—*General Controls Co.*, 801 *Allen Ave.*, *Glendale* 1, *Calif.*

Electric Heat Systems

ELECTRIC HEAT SYSTEMS utilize horizontal or vertical blower units, with built-in air filter, which have provisions for addition of a cooling and dehumidifying coil. Individual electric heating elements can be placed at the ends of the air distribution branches, so that the benefits of forced air circulation are ob-



tained without loss of heat in the duct system. The heating elements can be controlled individually by thermostats in each room, allowing adjustment for room use or location, or the system can be operated from a central thermostat. Individual electric heat units range from 1700 to 15,450 Btuh, with four different capacities available—*The Williamson Co.*, 3500 *Madison Rd.*, *Cincinnati* 9.

Burner Lighting Tube

MODERN CARRY-OVER TUBE for integral lighting of the sections, provides a positive flame track between the burners and the pilot. It is a 304 stainless steel tube, 3/8 in. O.D., with either single or double rows of lanced ports extending over the active lighting length. It is engineered to fit each unit and to be a smoothly functioning component of a product, according to the manufacturer. The feed to the carry-over tube is located as closely behind the automatic valve as is practical since the larger burner orifices will pass gas more readily than the smaller orifice for the carry-over tube. Improper distribution can cause poor timing and result in slightly delayed ignition—*Modern Lighters, Inc.*, 46330 *West Seven Mile Road*, *Northville*, *Mich.*

compare

• DESIGN • POWER • STAMINA

BUY A... **SIOUX ELECTRIC DRILL**

CERTIFIED SIOUX POWER

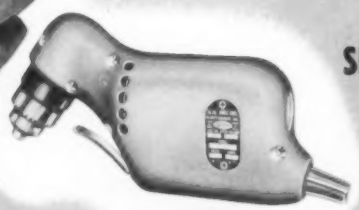
Electric Drills

When it's a SIOUX – you know what it will do!

The horsepower and torque for each SIOUX electric drill is rated, stated, and certified. You are not expected to buy just a drill. When it's a SIOUX you know what it will do. See complete power specifications for each SIOUX Electric Drill in the SIOUX catalog.

Super Powered 1/4" & 3/8" DRILLS!

Here is super torque for the toughest jobs. And a speed for every need. Entirely new design has placed the brushes at the fan position at the front of the drill. Advantages include easier inspection and replacement without disassembly of the tool, and cooler running. Catalog No.'s 1472,73,74 —1/4"; No.'s 1477,78,79—3/8".



SALES CHAMP

SIOUX No. 1495 1/4" All Angle Drill

This exclusive SIOUX design is a favorite of men who work with tools. It's the most convenient, rugged, fistful of power. It operates in restricted space where other drills can't be used. All around usefulness on the widest range of jobs make this sturdy, dependable No. 1495 one of the world's best drill buys.

SIOUX

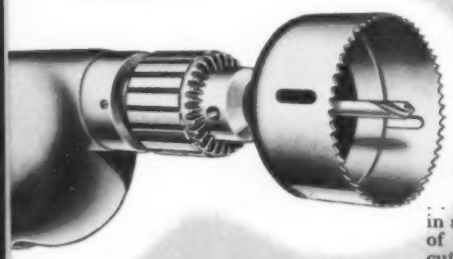
ELECTRIC SCREWDRIVERS

No. 260

On No. 260 Super Screwdriver, the operator controls the tightness with which a screw is set by the amount of pressure he applies. The 1/4" Hex Drive takes shanks for clutch head screwdriver bits, Reed and Prince, Standard screws, Phillips, and socket (Allen Type). On the No. 262 Super Screwdriver tightness is pre-determined by adjusting the clutch. Both models are equipped with reversing switch.

No. 242

It fits the hand, and operates in restricted space like no other electric screwdriver. It quickly drives or removes all types of screws. No. 242 has a positive clutch; the operator controls the tightness by the amount of pressure applied. No. 246 has an adjustable clutch, so that it can be preset for any uniform degree of tightness desired.



SIOUX *High Speed* STEEL HOLE SAWS

. . . cut holes from 5/8" to 6" in diameter, in any free machining material to a depth of 1 1/8". Alloy or stainless steel may be cut at slow speed. High-Speed steel teeth welded to chrome-vanadium body give maximum life and cutting ability.

Look Under **"TOOLS, ELECTRIC"** *in the Yellow Pages*

ALBERTSON & CO., INC.

SIOUX CITY, IOWA, U. S. A.

• AIR IMPACT WRENCHES • AIR SCREWDRIVERS • ELECTRIC IMPACT WRENCHES • ELECTRIC SCREWDRIVERS • DRILLS • GRINDERS • SANDERS • POLISHERS • FLEXIBLE SHAFTS • PORTABLE SAWS • VALVE GRINDING MACHINES • ABRASIVE DISCS.

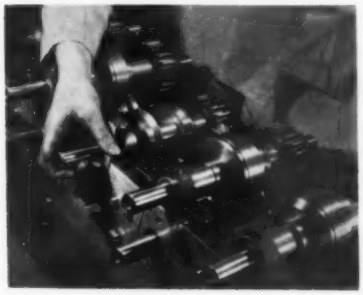
equipment developments
(Continued)

Stainless Steel Burner

DS SERIES stainless steel burner features formed port burners with integral carryover. It can be used with gases ranging in heating values from 500 to 3200 Btu per cu ft. Features of the burner are narrow port sections, high external port depth, straight-line shape, and it is an all resistance-welded unit of tubular shape, according to the manufacturer —*Reznor Mfg. Co., 6 Union St., Mercer, Pa.*

Modified Cleat Machine

REMOVABLE STATION arrangement applied to the basic lockforming standing "S" cleat rolling machine chassis permits rapid changing of rolls without major dismantling of the machine. Pulls can be furnished for the standard width machine or



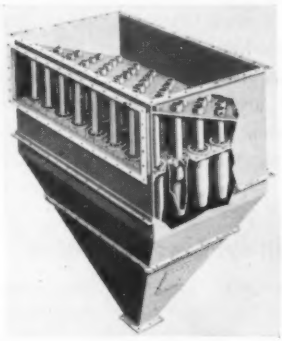
machines widened to any required width up to a maximum of 13 in. on the inboard side. The unit is complete with production type roller bearings and lubrication fittings to each bearing. It is equipped with a 10 hp, 900 rpm motor and all necessary electrical controls—*The Lockformer Co., Dept. AA-8, 4615 W. Roosevelt Rd., Chicago 50, Ill.*

Dust Collector

CYCLONE COLLECTOR is a recent addition to this firm's line of air pollution control devices. It is a standard unit, but several types are available for use in the power, cement, steel and similar industries. Some of the

equipment developments
(Continued)

many materials which can be recovered include: cement, chemicals, coal dust, stoker ash, silica dust, slag dust and stone dust. According to the manufacturer, the collector tubes and inlet vanes are designed to assure



uniform gas flow to each cyclone and to provide the high centrifugal force necessary to remove even the lower range of particle sizes—*John Wood Co., Air Pollution Control Div., Bernardsville, N.J.*

Dimple Slotter Attachment

DIMPLE SLOTTER indenting and slitting machines are designed for use with punch press or press brake. Press model dimple slotters form "dimple" and slot in sheet metal up to 16 ga to permit fast, easy assembly of louvers, vane runners, air extractors, etc., without notching, or other manual operations. Press model B-2 can be secured to die rail or bed of the press, with nothing attached to the ram—*Airo Industries*, 1712 *West Florence Ave., Los Angeles* 47.

Power Roof Exhausters

"KEY LINE" is a line of aluminum power roof exhausters that is offered in both centrifugal (Series CK) and axial (Series AK) models. These units have the motor and drive assembly mounted out of the air system. The smallest unit is 20½ in. high, and the largest is 33 in. high. According to the manufacturer, the motor mounting is hinged to provide ready access for wiring. Pulleys are

Luxaire®

puts the ORDER in your hand!

...and MONEY in your pocket!

You'll find it easier to land the order, easier to make money — because you get *more of everything* with Luxaire!

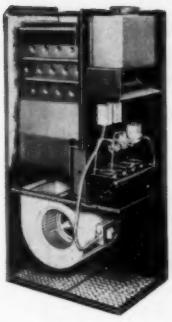
Consider the competitive Luxaire qualities in terms of weight. Luxaire Furnaces give you Heavy Gauge Heating Elements throughout the entire line. Compact, well styled Luxaire Cabinets are rigid and solid — die-formed from 21 Gauge Steel.

Realize Luxaire excellence as a matter of available Air Deliveries. Practically every Luxaire Furnace has ample Blower Capacity so that cooling can be added with the standard equipment blower.

Experience superior Luxaire performance. No other major line has a more enviable reputation for trouble-free operation.

Discover Luxaire pricing. It is consistently competitive all along the complete line, eliminating any need to choose between a low price and excellence — for Luxaire gives you both!

Now, see your Luxaire jobber, who stocks your unneeded inventory in his warehouse!



Interior view of Upflow Unit, showing the rugged construction and uncomplicated design.

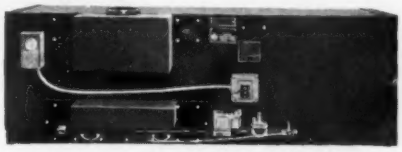
A COMPLETE LINE OF GAS A. C. UNITS

Upflow — Compact, completely assembled and wired units — 75,000 to 200,000 Btu.

Counterflow — Completely assembled and wired — 75,000 to 150,000 Btu.

Horizontal — Low and compact, assembled and wired — 80,000 to 140,000 Btu.

Basement — Compactly packaged, heavily constructed, easily assembled — 105,000 to 260,000 Btu.



Horizontal Gas Furnaces Designed with Add-On Cooling in mind! Low and Slender!

Interior view of Upflow Unit, showing Round Heating Element and Refractory Firebox!

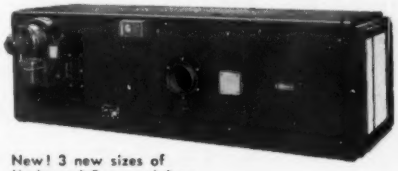
A COMPLETE LINE OF OIL A. C. UNITS

Assembled and Wired — Winter Air Conditioners with refractory Firebox — 78,400 to 112,000 Btu.

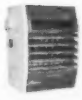
Counterflow — Completely and partially assembled — 78,400 to 123,200 Btu.

Horizontal — Heating element, blower and motor assembled in casing — 89,600 to 224,000 Btu.

Basement — Heavily constructed, readily assembled — 84,000 to 224,000 Btu.

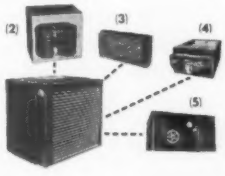


New! 3 new sizes of Horizontal Furnaces! Low and Slim with increased Air Handling!



Gas Fired Unit Heaters, 5 Models

Gas Conversion Burners



(1) 2, 3, 4, 5 H.P. Air Cooled Condensing Units, (2) Plenum Evaporator, (3) Duct Evaporator, (4) Counterflow Evaporator, (5) Blower-Evaporator Unit.

Year 'Round Combination Units, Air or Water Cooled, Gas or Oil Fired

Winter Air Conditioners Gas Fired or Oil Fired

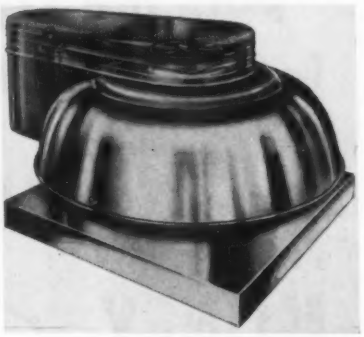
THE C. A. OLSEN MANUFACTURING COMPANY • • ELYRIA, OHIO

Luxaire® HEATING & AIR CONDITIONING UNITS

equipment developments

(*Continued*)

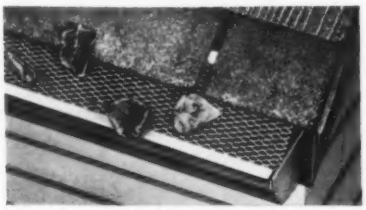
of heavy cast iron construction and are adjustable to permit speed variation. Belts have long drive centers and are equipped with an automatic



tightening device. Drive bearings feature permanently lubricated and shielded ball bearings—*Jenn-Air Products Co., Inc.*, 1102 *Stadium Drive, Indianapolis* 7.

Aluminum Gutter Guards

"SNAP-ON" gutter guards are made of expanded screen, heavy gage, sheet aluminum which permits full flow of water. The manufacturer claims it



withstands heavy icing and will not rot even though wet leaves may lay on it for a long period of time. These guards can easily be removed and replaced in minutes—*Lockhart Mfg. Co.*, 6350 *E. Davison, Detroit.*

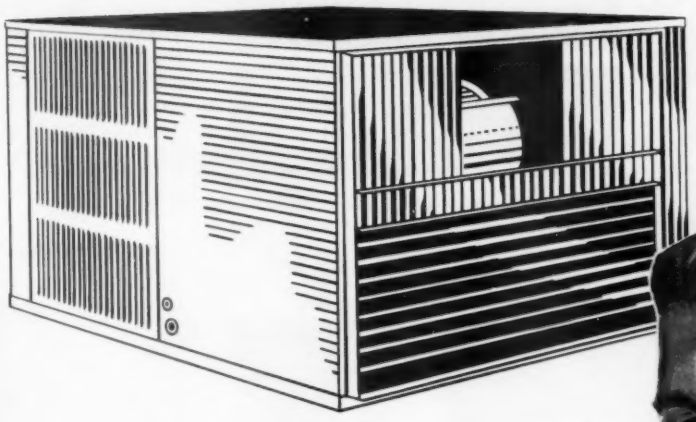
Fresh Air Heaters

GAS-FIRED fresh air supply heaters that permit minimum temperature rise as low as 3.3 degrees, according to the manufacturer. Units are available in five sizes, from 15,000 to 50,000 cfm and 1.5 to 4.5 million Btuh, based on any clean gaseous fuel with a

NOW, from

WRIGHT-TEMP

The Incomparable
Wright-Temp Heat Pump



year-'round air conditioner

Wright Manufacturing Company is proud to announce an important addition to their complete line of fine-quality air conditioning equipment — the Wright-Temp Heat Pump. In 2, 3, 5, 7½ and 10 ton sizes — package and remote models to meet every installation requirement.

Famous Wright efficiency of design and quality of materials and workmanship assure you of increased customer satisfaction and fewer "trouble calls".

The Wright-Temp Heat Pump is built and tested in the Southwest specifically to meet the extreme demands of Southwestern climates. Balanced engineering provides maximum air conditioning efficiency at lower cost in even the most extreme weather conditions.

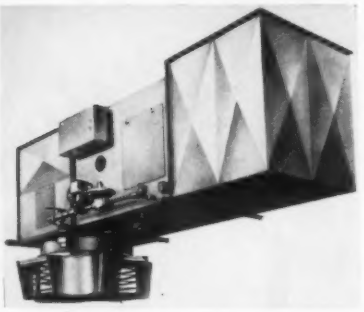
All Models Calorimeter Rated *Beyond*
A.R.I. Specified Conditions to 115°

For Complete Information write to

WRIGHT-TEMP
MANUFACTURING COMPANY
2902 West Thomas Road, Phoenix, Arizona
"Creating New Climates for Better Living"

equipment developments
(*Continued*)

range of 800 to 3200 Btu per cu ft. —*L. J. Wing Mfg. Div., Aero Sup-*



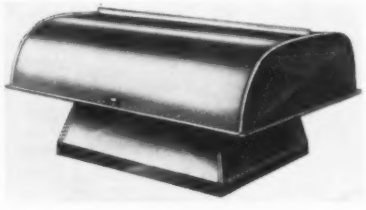
ply Mfg. Co., Inc., 306 *Vreeland Mills Rd., Linden, N.J.*

Cast Aluminum Blower

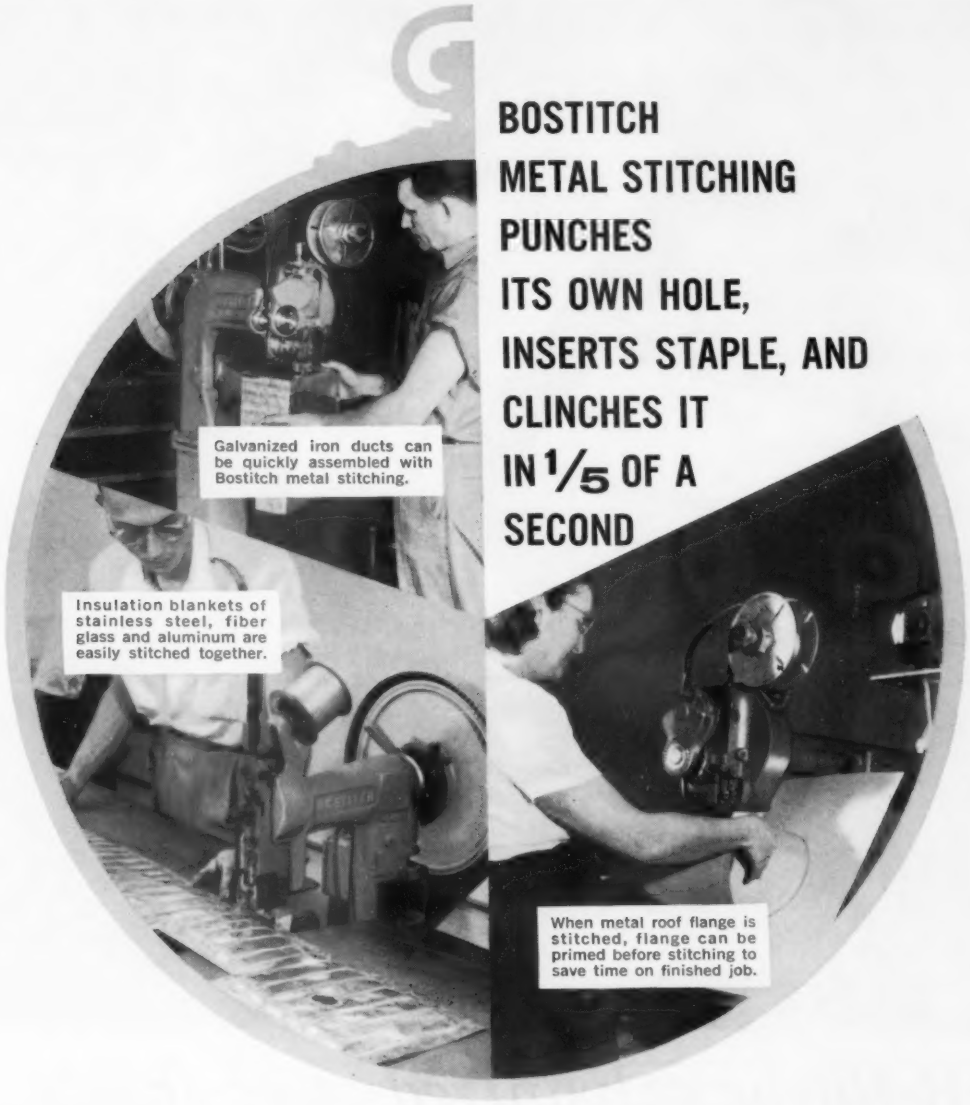
SPARK PROOF cast aluminum blower for use with dust collecting systems. The light weight blades are moulded into position for increased strength and rigidity. According to the manufacturer, the special design has improved suction efficiency and the new blower maintains all of the good performance characteristics of the plate fan—*Aget Mfg. Co.*, 1384 *Church St., Adrian, Mich.*

Ventilators

UNO-AIRE AND UNO-VENTAUSTER are two new items that have been added to this manufacturers line of gravity and powered ventilator equipment.



Uno-Aire aluminum power roof ventilator provides low contour through-the-roof ventilation. Uno-Ventauster is an improved stationary type gravity ventilator for use, in smaller sizes, on chimneys, flues etc.—*Uno Ventilator Co.*, 1236 *Eastern Ave., Malden, Mass.*



BOSTITCH METAL STITCHING PUNCHES ITS OWN HOLE, INSERTS STAPLE, AND CLINCHES IT IN 1/5 OF A SECOND

Compare it with any other fastening method for speed, economy and security.

Compared with riveting or bolting—stitching eliminates pre-punching, pilot drilling, redrilling on assembly, matching holes, hand insertion and heading or tightening of bolts. It also eliminates back stripping in attaching rubber or fiber and some plastics to metal. Stitch is formed, driven and clinched in 1/5 of a second. Possible time savings as high as 90 per cent.

Compared with spotwelding—stitching is twice as fast. Pre-cleaning and removal of flash is unnecessary. Low heat generation causes virtually no warping—surfaces can be painted before stitching. No electrodes to clean. Mating and clamping of work is less critical. Flange distances can be reduced. Stitched parts can be disassembled safely. "Sandwich" arrangements of various metals and non-metallic materials can be stitched easily and quickly.

Compared with cementing—stitching secures positively and instantly, even though surfaces might be damp or dirty.

Compared with clips—Bostitch staples go *through* material, giving you greater holding power. Because staples *penetrate*, they hold fast.

Compare . . . you'll likely turn to Bostitch metal stitching because it is fast, economical and secure. Machine speed up to 295 stitches a minute. Holding power is adequate on almost any job where it can be used.

Ask your Bostitch Economy Man *now* to show you how stapling cuts manufacturing and installation costs.

Fasten it better and faster with

BOSTITCH®
STAPLERS AND STAPLES

947 BRIGGS DRIVE, EAST GREENWICH, R. I.

Bethcon galvanized steel sheets permit long spans, minimum supports

Strong and rigid—because they're steel—Bethcon galvanized sheets form up into strong and rigid ductwork which requires a minimum number of supporting brackets.

In addition, a Bethcon galvanized steel sheet is just right for easy shopwork . . . not too hard, not too soft. That's because we use a special annealing cycle which gives the sheet an ideal balance of ductility and strength.

Bethcon's zinc coating is second to none for its refusal to flake or peel off. Bethlehem's continuous galvanizing process bonds zinc to steel so tightly that even when the sheet is doubled back on itself, the coating stays put. Hemming without puckering or wrinkling is no problem with Bethcon sheets.

You can specify Bethcon galvanized sheets in a wide variety of gages, with either plain open-hearth or copper-bearing (Beth-Cu-Loy) steel for the base metal. We'll be glad to furnish any details you need. Just get in touch with our nearest sales office.

Galvanized Steel

for Strength
. . . Economy
. . . Versatility

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

equipment developments

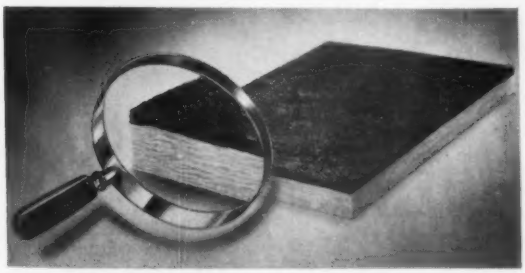
(*Continued*)

Direct Drive Attic Fan

FEATURES of this direct drive attic fan include: baked enamel finish; steel blades; and extra large junction box for fast wiring. The 30 in. fan uses a permanent split capacitor 8 pole motor, and is designed to operate at 835 rpm, according to the manufacturer. Ceiling shutters, that are available for use with this unit, feature "flutter" proof design, overlapping aluminum louvers mounted in formed steel frame and fusible link for extra safety. The entire shutter can be mounted in the ceiling with no trim required—*Emerson Electric Mfg. Co.*, 8100 *Florissant Ave., St. Louis.*

Fiber Glass Duct Liner

"MICRO-BAR" fiber glass duct liner is a resilient, semi-rigid insulation blanket of strong, fine glass fibers bonded by a thermosetting resin. It is available in ½, 1, 1½ and 2 in. thicknesses. According to the manufacturer, the black colored surface is made of heavy



density fiber glass for resistance to the high air velocities of up to 5000 ft per minute. Underneath the heavy density surface is the light density portion which provides sound absorption and overall thermal performance. Noise from motors, fans, rushing air, voices and other sounds are quickly dissipated in the material's myriad air spaces. These same spaces make it a good barrier to heat passage. The material, in 24, 36, 46½ and 48 in. widths, is packaged in 50 to 200 ft rolls, depending on thickness—*Johns-Manville, Industrial Insulations Div., 22 East 40th St., New York.*

Oil-Fired Gravity Furnace

MODELS 95 GOB oil-fired gravity furnaces are 53 in. high, 24 in. wide, 30 in. deep, and are approved for zero clearance on sides and rear. Flue pipe diameter is 6 in. The heating element is welded into a seamless gas type unit and two baffles are designed and placed for maximum heat extraction, according to the manufacturer. Thick foil backed glass wool insulates the heater exchange—*Bonair Division, Peerless Products Co., 23rd & Sedgley Sts., Philadelphia.*

new literature . . .

Aluminum Rib Roofing and Panels

ADVANTAGES OF ALUMINUM RIB ROOFING and "Color-rib" panels for homes and farms are discussed in a four-page, illustrated bulletin. Material is light in weight and easily bent to shapes required, the company points out, thus providing ease of handling and building. Other advantages include heat reflectivity, corrosion resistance and ease of maintenance since no painting is required. Illustrations show end and sidewall flashing, plain and adjustable ridge cap, rubber end seal and translucent skylights. Application drawings are also included. Also available is AIA File No. 12-C J-8767 which explains how to apply rib roofing and siding—*Aluminum Co. of America*, 1501 *Alcoa Bldg., Pittsburgh* 19.

Standards for House Insulation

PERFORMANCE STANDARDS for house insulating materials made by member companies of the National Mineral Wood Association are described in the booklet, "Mineral Wool Insulation and the All Weather Comfort Standard." The All Weather Comfort Standard is explained in the foreword which tells how this standard was developed for electrically heated and air conditioned houses by a group of electric utilities and manufacturers of electric heating and air conditioning equipment, insulation and window glass.

The All Weather Comfort Standard limits heat loss for these houses to "U" values of 0.05 for ceilings, 0.07 for walls, and 0.07 for floors over vented crawl spaces. The National Mineral Wool Association's performance standards establish "R" factors for insulations that meet the requirements. The "R" designates the effect of the insulation in place, including adjacent air spaces and surfaces.

Copies are 10 cents each—*National Mineral Wool Association*, 1270 *Sixth Ave., New York* 20.

Oil-Fired Heating Equipment

OIL-FIRED WINTER AIR CONDITIONERS are illustrated in a two-page, three-color circular. Units illustrated include lowboy, highboy, counterflow, horizontal and floor models—*Federal Heating and Cooling Corp.*, 126 *W. Tremont Ave., Charlotte, N.C.*

Installing Heating, Cooling Units

MANUALS present installation instructions for heating and cooling equipment. For heating installation instructions request Manual ME-132; for cooling, Manual ME-131—*Chrysler Corp., Airtemp Div., P. O. Box* 1037, *Dayton* 1.

You can tell a Metalbestos Man

By the Gas Vent Calculator he uses!

This handy new pocket computer is the only device of its kind to give correct answers in seconds to the most complicated vent design questions. Who's it for? Why the man who installs Metalbestos, of course! It allows him to make his "take-offs" on the spot, give fast accurate bid estimates, save precious minutes on the job. Just one more scientific selling tool from Metalbestos — it's yours without charge.

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new literature

(Continued)

Registers and Grilles, Accessories

A CATALOG OF REGISTERS, grilles, diffusers and accessories for residential and commercial air distribution systems includes capacity selection charts containing data on grille, register or diffuser size; static pressure; air throw; air drop; cfm; fpm; and approximate floor area covered. Additional tables show list prices, standard colors and finishes available.

Details of adjustment of vanes and dampers, application instructions and installation information are given along with photographs of smoke tests for certain models.

Catalog covers single and multiple valve registers; circular and square ceiling diffusers with and without dampers; floor, wall and baseboard diffusers; baseboard return intakes; perimeter return grilles; dual purpose (heating and cooling) registers; gravity type base, floor and sidewall registers and grilles; commercial air conditioning registers and grilles; installation frames; branch duct dampers; back pressure dampers; outside intake ventilator grilles; door grilles; and perforated metal lattice style grilles. Write for Catalog A—*United States Register Co., 344 E. Burnham St., Battle Creek, Mich.*

Industrial Fans

ENGINEERING DATA for exhaust and blower systems is presented in Bulletin IF-100. Also included is information on industrial fans ranging in capacity from 270 cfm to 48,000 cfm at ½ to 18 in. static pressure. Capacity tables show static and mechanical efficiencies of air and material handling fan wheels at each point of rating—*General Blower Co., Subsidiary of Ilg Electric Ventilating Co., 8600 Ferris Ave., Morton Grove, Ill.*

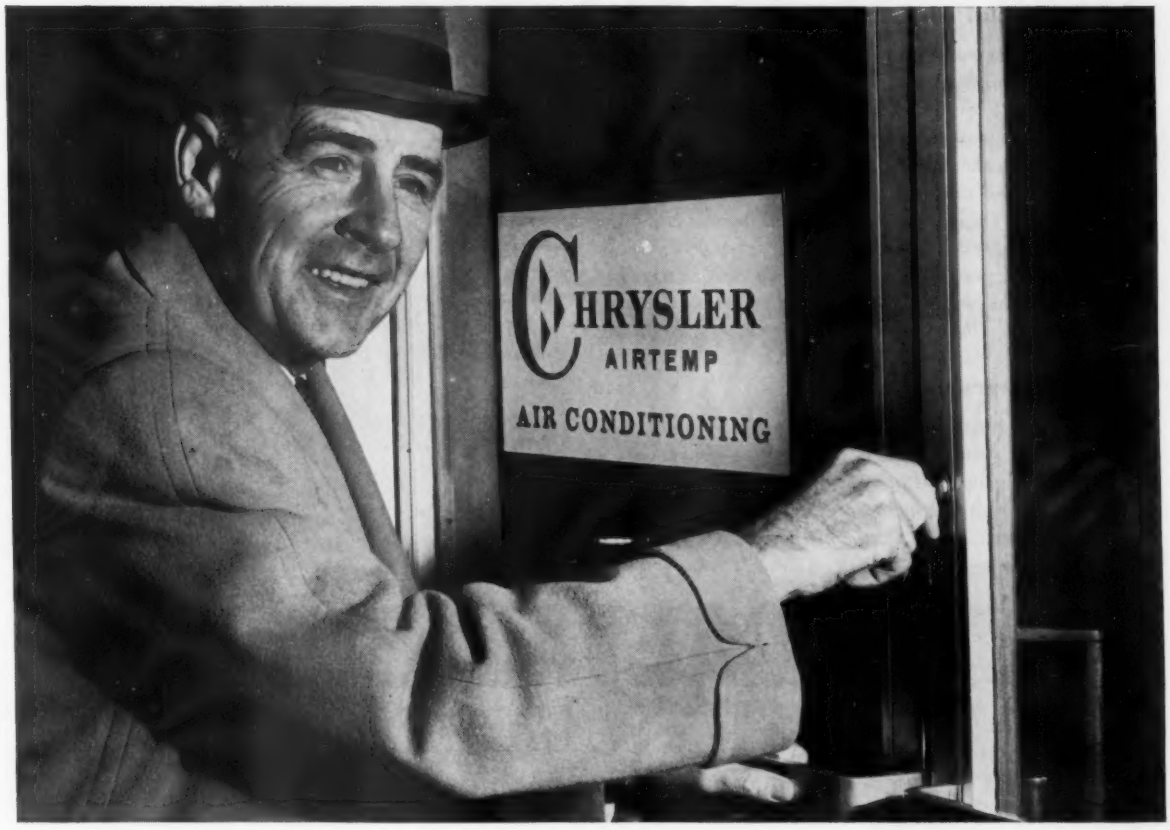
Sheet Metal Specialties

CATALOG ILLUSTRATES AND DESCRIBES flexible duct connectors, vane rail, blade kits, damper regulators and other sheet metal specialties. New products listed include "Drill Screw," which drills its own hole in sheet metal, "Wedge-Loc" ⅜ in. regulator set featuring locking action designed to prevent damper rattle, "Duro-Trol" high impact plastic air flow regulator, and an economy adhesive for attaching insulation to duct work—*Duro-Dyne Corp., Route 110, Farmingdale, L.I., N.Y.*

Air Filters

TECHNICAL DATA BULLETIN for dealer-contractors, wholesalers and users gives information on electrostatistic filters for furnaces and air conditioners. Included are performance characteristics of new filter

Sell Climate by Chrysler



Dealers who sell Chrysler Air Conditioning . . .

enjoy more prestige

Prestige comes in two varieties: The kind you earn by sweat of brow. And the kind that rubs off on you when you're with someone who's already earned it. Both can be yours when you sell Chrysler Air Conditioning.

Chrysler has long been one of the most respected names in the air conditioning business. It's almost synonymous with engineering superiority. Our famous name helps you sell.

But we're not going to tell you, "If you sell Chrysler Air Conditioning you can forget about working." You know—and we know—there's no substitute for hard work. But we do say the Chrysler name and product line make it easier for you to earn, and hold, the best reputation in town.

If you're interested in nine more reasons why your future is safer with Chrysler, send for the booklet, "It will pay you to take a long look ahead . . . with Chrysler Airtemp."

CHRYSLER
AIRTEMP

Airtemp Division, Chrysler Corporation, Dept. N-70, Dayton 1, Ohio

Please rush me a copy of the "Long Look" Booklet

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COMPANY _____

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CITY _____ COUNTY _____ ZONE ___ STATE ___

material designated "Poly-Mag 80," filter maintenance and cleaning tips, recommended specifications, and charts showing pressure drop and capacities of various size filters—*Stoddard Industries, Inc.*, 3383 *E. Layton Ave., Cudahy, Wis.*

Commercial Air Conditioning

PRODUCTS USED IN COMMERCIAL air conditioning applications are described in Form No. JS-155P. Featured is "52 Series" air cooled condensing unit, which uses an oversized condensing coil, positioned diagonally in the cabinet. According to the company, this air cooled unit operates in outside temperatures up to 125 F. Other products described include add-on cooling units, self-contained systems, suspended blower coils and year 'round systems—*Janitrol Heating and Air Conditioning, Div. of Midland-Ross Corp., Columbus* 16, *Ohio.*

Gas Conversion Burner

BULLETIN EXPLAINS MECHANICS, operation and installation of "Swift Switch" power gas conversion burner featuring self-lighting pilot. Keyed photograph shows features including quiet blower, ceramic flame spreader, 6000 volt transformer and adjusting rods for quick and accurate air adjustment. Request bulletin No. GC-571-M8—*Lennox Industries Inc.*, 200 *S. 12th Ave., Marshalltown, Iowa.*

Zone Control for Heating and Cooling

HOW TO INSTALL "Zone-A-Trol" individual room temperature or zone control for residential or commercial air conditioning and warm air heating systems is explained in a four page illustrated brochure. The brochure also describes how to install low voltage operated damper actuators and air pressure dumper dampers—*Econo Products Co., Div. of Viking Instruments, Inc., East Haddam, Conn.*

Motor Selection

"MOTOR APPLICATION GUIDE," (16 pages) outlines motor characteristics and presents up-to-date information on motor designs. Factors in motor selection are described and models for special applications are illustrated. Ask for bulletin 270B—*Century Electric Co.*, 1806 *Pine St., St. Louis* 3.

Commercial and Industrial Fans

SERIES 3000 CENTRIFUGAL FANS with flat, backwardly inclined blading are described in catalog 1120-1 (76

NEW!

a book prepared especially for sheet metal contractors

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for the asking . . .

Here's a new book about FOLLANSBEE TERNE, the exciting, metal roofing material that is causing so much attention in the building field today. You'll find it very helpful. It details the steps for installing Follansbee Terne in standing, batten and flat lock seam roofs as well as the new bermuda roof. It's yours for the asking—just fill in and mail the coupon below.

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Gentlemen:

I'd like _____ copies of your new book about Follansbee Terne

NAME _____

COMPANY _____

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new literature

(*Continued*)

pages). According to the company, fans are suitable for a number of uses, including supply and exhaust applications, general building ventilation, industrial air conditioning, and vehicular tunnel ventilation. Included are a discussion on effects of temperature and altitude, application and selection information, and photographs illustrating construction features and arrangements. Performance data and dimensions are presented in tabular form—*Westinghouse Electric Corp., Sturtevant Div., 200 Readville St., Hyde Park 36, Mass.*

Oil Burner Service and Installation

TROUBLE SHOOTING GUIDE (62 pages, 50 cents) contains information on troubles frequently encountered by servicemen on oil burner installation and service jobs. It includes data on field checks for stack relays and fuel units as well as tips on servicing rotary and low pressure burners. Also included is information on shell head installation and adjustment, wiring, electrical measures, fuse replacement, control circuits, thermostat installation and clock thermostat setting. Booklet is illustrated throughout with diagrams, drawings and product photos—*Sid Harvey Inc., 100 E. Mineola Ave., Valley Stream, N.Y.*

Belt-Driven Fans

BELT-DRIVEN TUBEAXIAL FANS with diameters ranging from 30 to 60 inches and air deliveries up to 85,000 cfm are described in bulletin 625. Included is data on ventilating system designs with emphasis on hood design and open surface tank ventilation. Photos, tables and engineering drawings are used throughout—*Customer Service Dept., Propellair Div., Robbins & Myers, Inc., Springfield, O.*

Sheet Metal Fasteners

FEATURES OF "WEATHER GARD" FASTENERS for use with aluminum, galvanized steel, protected metal and other construction materials are described in a four-page, illustrated bulletin. Fasteners feature three-piece assembly permitting free rotation of head and providing complete seal and surface protection, according to the manufacturer. Illustrated are sheet metal screws, grommet seals, wood screws, bolts and nuts, and drive screw nails—*Construction Fasteners, Inc., Spruce and Water Sts., Reading, Pa.*

Gas Vent Pipe

"TRANSITE" ASBESTOS CEMENT GAS VENT PIPE is described and applications are illustrated in a four-page folder designated TR-259A. Pipe is suitable for all

new literature

(Continued)

type B services, according to the manufacturer, including residential gas-fired floor and central furnaces, water heaters, and space heaters. Cost advantages are achieved, the manufacturer states, because of low material cost and speed and ease of installation—*Johns-Manville, 22 E. 40th St., New York* 16.

Sheet Metal Working Machinery

DATA SHEET presents information on 5 and 10 ft "Over the Lock" pipe rolling machines. Also available are data sheets covering "Husky" presses and "C" multi-punching machine. Specifications are included—*Fallsington Mfg. Co., Fallsington, Pa.*

Condensing Units, Cooling Coils

SIX PAGE CATALOG (No. 310, superseding No. 295) illustrates and describes 2, 3, 4 and 5 hp "Luxaire" air cooled condensing units and add-on cooling coils. Printed in four colors, the catalog provides interior illustrations and breakdown descriptions of each of the four sizes. Also pictured and described are "Luxaire" round or oval cooling coil for installation in plenum chambers; counterflow cooling coil for installation beneath counterflow furnaces; and duct cooling coil for installation in discharge air duct of horizontal furnaces—*The C. A. Olsen Mfg. Co., Filbert St., Elyria, Ohio.*

Year 'Round Equipment

LITERATURE covers heating, summer air conditioning and year 'round equipment for residential and commercial applications. Included are illustrated circulars and bulletins covering heat pumps, electronic air cleaners, gas-fired furnaces, "Twinline" and "Pathfinder" residential-commercial air conditioners, and "Comfort Center" year 'round units for residential applications. Consumer bulletins are printed in full color—*York Corp., Subsidiary of Borg-Warner Corp., York, Pa.*

Fractional HP Electric Motors

TWELVE-PAGE CATALOG describes and illustrates fractional hp electric motors, blowers, replacement kits, brackets, fan blades and accessories for replacements, in-plant use, and product applications. New items described include replacement motors for air conditioning units from 1/3 through 2 hp and type "AO" all-angle operation motor available in capacities from 1/20 through 1/8 hp. New "AO" blowers designed to deliver 800 cfm are also described. Dimension diagrams, charts showing hp ranges, and air delivery graphs are included—*Redmond Distributors Div., Redmond Co., Inc., 201 Monroe St., Owosso, Mich.*

we hear that . . .

"MAIN STREET U.S.A." was dedicated recently by secretary of commerce Frederick H. Mueller (third from left) at Greenfield Village, Dearborn, Mich. Representing the warm air heating and air conditioning industry is American-Standard Air Conditioning Div. From left are: William P. Sheehan, advertising and sales promotion manager for the division; William Clay Ford, president of the museum and Greenfield Village; Mr. Mueller; and Clyde H. Wilkinson, president of American-Standard's Air Conditioning Div.

▶ PEOPLE IN MORE THAN 200 CITIES throughout the United States during the next five years will learn how modern air conditioning craftsmen can provide complete year 'round comfort in their homes. The story of modern residential year 'round air conditioning will be featured in an exhibit presented by the American-Standard Air Conditioning Div. as part of the Henry Ford Museum display entitled "Main Street U.S.A."

"Main Street U.S.A.," set up on two specially designed railroad cars, will visit approximately 40 major areas per year. Half of the display represents a 19th century street of shops, the windows of which are filled with merchandise that was sold during the 1800's. Directly opposite these shops is a series of exhibits depicting today's counterparts of 19th century merchandise.

According to C. H. Wilkinson, president, American-Standard Air Conditioning Div., "Main Street U.S.A." will serve as a peg for local "Merchants' Week" celebrations. It is anticipated that most exhibition cities will have week-long promotions, special sales, and other programming that will tie in with the exhibit.

The train will stay approximately one week in each exhibition city and the show will be open to the general public except for the first day, which will be "Merchants Preview Day." On that day, merchants and business leaders will be invited to view the exhibition. Also invited will be representatives of the press, radio and television. Local organizations will sponsor the exhibition in each city as a public service. Publicity will be distributed to all media in exhibition areas and advertising will appear in newspapers and on radio and TV stations.

we hear that

(Continued)

▸ JOSEPH B. ELLIOTT, formerly president of Schick, Inc., and at one time executive vice president for Radio Corp. of America, became president and general manager of the York Div., Borg-Warner Corp., on June 1. Other positions Mr. Elliott has filled include president of Tele-Dynamics, Inc., and executive vice president of Raymond Rosen, Inc., RCA distributor in Philadelphia. He succeeds Henry M. Haase, who has headed York since 1956 and is now being transferred to Borg-Warner headquarters in Chicago. Mr. Elliott, whose responsibilities at RCA included the supervision of the air conditioning and other departments, recently described air conditioning as "the next big growth industry."

Joseph B. Elliott

William E. Judd

▸ WILLIAM E. JUDD, general manager of the Stewart-Warner Heating and Air Conditioning Div., has been elected a vice president of Stewart-Warner. Mr. Judd has been with the firm since 1942, and has served in various capacities including assistant to the president.

▸ WALTER STEITLER, vice president of Carrier Corp. and its director of marketing, was one of those chosen by the secretary of defense to attend the recent Joint Civilian Orientation Conference, held twice a year by the Department of Defense. Object of the conference is to give leading citizens personal contact with civilian and military personnel throughout the Department of Defense.

▸ THREE TRIPS to three different continents are among the sales incentives offered by Fedders Corp. to dealer-contractors handling central air conditioning and heating equipment. U. V. Muscio, executive vice president, said that the sites of the "Dream Holiday" trips are Israel, Paris and Grand Bahama Island. According to Mr. Muscio, the company expects that about one thousand will take the trip to Israel, about the same number will go to Paris and approximately four thousand will visit Grand Bahama Island.

▸ FRAM AIRE CORP., Div. of Fram Corp., has opened a new production facility in Henderson, N. C. The new plant has 40,000 sq ft of floor space.

we hear that

(Continued)

▶ MILLER ELECTRIC MFG. CO., INC., Appleton, Wis., is celebrating its 30th birthday this year. Niels C. Miller, president of the company and inventor of the Miller a-c arc welder, has prepared a 52-page book describing the progress achieved since the firm was established in 1929. In its pages are shown present personnel, facilities and products manufactured today.

A brief history is presented and is followed by descriptions of the main function of the major departments. The contributions of each individual, from the president to those who serve after the main body has gone home—the watchmen and cleaning staff—are also discussed.

Copies of the "Miller Electric Story" are available upon request.

▶ CHARLES F. SEELBACH JR. has been elected president and general manager of Forest City Foundries Co. Other officers elected are Charles F. Seelbach Sr., chairman of the board; William F. Seelbach, first vice president; Ralph G. Wieland, second vice president; and Walter Kremser, secretary-treasurer.

▶ CRANE CO., has purchased the fixed assets and inventory of the General Air Conditioning Corp. of Los Angeles. General Air Conditioning manufactures heat pumps, reverse cycle air conditioners and other products. According to Wesley A. Songer, Crane president, present sales and service to customers will be maintained through General Air Conditioning's national distribution system.

▶ WILLIAMS OIL-O-MATIC HEATING CO. recently held a low pressure oil burner school for dealer-contractors. The program included such subjects as the principles, features, operation, installation and servicing of the company's low pressure burners. All those attending passed an examination and were awarded a certificate of accomplishment.

▶ FORTY-SIX AIR CONDITIONING dealer-contractors and servicemen from northeastern Indiana and southwestern Michigan visited Sidney, Ohio, recently to inspect the manufacturing facilities of the Copeland Refrigeration Corp. and to take part in a panel discussion of field service problems. The trip was arranged jointly by Copeland and the F. H. Langsenkamp Co., South Bend, Ind., wholesaler.

▶ ALL DISTRICT MANAGERS of The Lima Register Co. as well as executives, including N. F. Jones, general manager, and Lee Beckman, works manager, were in attendance at the firm's recent annual sales meeting. Subjects covered included new product engineering and marketing trends. Advertising and

we hear that

(Continued)

sales promotion plans for the coming year were introduced and equipment features were discussed. The three-day conference was under the direction of C. B. Armour, sales manager.

▸ Day & Night Mfg. Co., is offering a $20 replacement allowance on "Armored Jetglas" water heaters if they fail within the unconditional warranty period.

▸ J. F. Thorne, assistant product manager, sheet metal products, for Inland Steel Products Co., has been appointed vice president and chairman of the technical committee of the Metal Ventilator Institute.

▸ The Turner Corp. will celebrate its 90th anniversary this fall with new merchandising and packaging programs. Two new torch kits are being introduced. Model LP 555X propane torch will include a free spark lighter as an anniversary special.

▸ Reynolds Aluminum Supply Co. has begun construction of a 38,000 sq ft plant in Jacksonville, Fla. Paul H. Fox, president of Reynolds, said the new building will house more than a quarter of a million dollars worth of industrial metals and building products.

▸ Clem Alexander Jr. was recently elected president of the Johnson Furnace Co. Kansas City, Mo. dealer-contractors. Guy W. Johnson Jr. was elected executive vice president and John W. Grist first vice president.

▸ Barber-Colman Co. plans to expand its facilities to meet increasing demands for automatic controls and air distribution products. The new addition will increase present plant area by approximately 170,000 sq ft, according to the company.

▸ Industrial Acoustics Co., Inc., now provides noise control equipment on a lease basis. If the customer wishes, he can purchase equipment at the end of the lease period.

▸ A $1 million sales training program designed to help its stainless steel distributors and their salesmen become order makers rather than order takers has been launched by Republic Steel Corp. Phase one of the program consists of a series of product education and sales meetings where distributors and their salesmen will be given information on stainless steel technology, fabrication and application as well as information related directly to techniques of selling. Phase two, running concurrently, is a campaign aimed at potential customers—designers, fabricators and consumers. As part of phase two, the company

we hear that

(Continued)

has prepared a series of color films designed to help pre-sell the product and to create new demand for stainless. Films include "The New World of Stainless Steel," which is directed to designers, architects, engineers, builders, etc., and "A New Look at Modern Living," which will be shown to the public at club meetings, schools, theaters and TV stations.

▸ THE MAJESTIC CO., INC., recently received an award in recognition of its "outstanding achievement in developing among employees a better understanding of business and the American economic system." Awards are presented to outstanding firms each year by the Chamber of Commerce of the United States under its National Recognition Award Program. In making the presentation, Erwin D. Canham, president of the national chamber, said: "Majestic makes major use of letters and meetings. Monthly letters from the president give a continuous report on sales and the company profit position, as well as a wide range of company information that relates employee well-being and security to the welfare of the company. Employee meetings are frequently held for the purpose of transmitting economic information necessary to establish good attitudes toward the company."

▸ H. C. LITTLE BURNER CO., INC., has purchased Tamco Corp., Sebastopol, Calif. Tamco will continue to operate as a separate enterprise, according to R. H. Ginther, Little's vice president.

▸ SKUTTLE MFG. CO. is currently celebrating its 25th anniversary as manufacturers of humidifiers and filters for warm air furnaces. Formed in 1935, the company consisted of John L. Skuttle and four partners. First employee was Russell Geisler, now president of the company, who joined the firm late in 1935. The following year Ken Fournier, now sales manager, was hired as a production worker. The firm moved into its Milford, Mich. plant in 1953.

▸ TO IMPROVE SERVICE FACILITIES for its electric tool customers in the Rocky Mountain area, The Black & Decker Mfg. Co. has moved its Salt Lake City factory service branch to 1541 S. Second West St. Off-street parking is available to customers, and factory trained personnel are equipped to render 24 hour service at this new location, according to Ralph W. May, branch service manager.

▸ LAU BLOWER CO. has purchased assets of the Viking Air Products Div. of the Crane Co. Viking will be operated as the Viking Air Products Div. of the Lau Blower Co., according to T. I. Byrd, Lau president.

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Addition to Northwest Junior High, Kansas City, Kansas. Contractor: Haren & Laughlin Construction Company. Heating Contractor: Molnar Plumbing & Heating. Heating Sub-contractor: Blake Heating & Air Conditioning Co. Architect: Radotinski-Meyn-Deardorff.

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Lightweight, economical SONOAIRDUCT Fibre Duct is easy to install—saves contractors and owners time, labor, and money! Available in 23 sizes, 2" to 36" I.D., in standard 18' shipping lengths—special sizes to order. Can be sawed.

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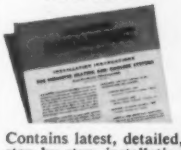

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- for longer life
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AUTOMATIC HUMIDIFIER

PRECISION BUILT TO AVOID COSTLY "CALLBACKS"

NEW **COMPLETELY STAINLESS**

MODEL 999

For any straight side warm air furnace

- Water leveling type
- New diaphragm design
- Only 4 lbs completely assembled . . less than 3¾-lb. strain on bonnet metal or plenum wall

2 GREAT TIME-PROVED THERMOSTATIC CONTROL MODELS

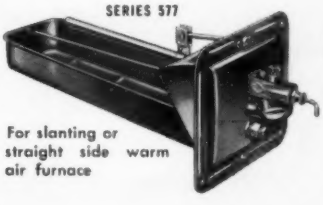
STAINLESS STEEL PAN . . .

heats more quickly . . . vaporizes water faster . . . resists chemical action of hard water . . . lasts far longer

SERIES 555C

For any straight side warm air furnace

SERIES 577



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Thermostatically controlled valve admits water to vapor pan in carefully measured amount for balanced humidity

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CEDAR FALLS, IOWA

Manufacturers since 1925 of a Complete Line of Automatic Humidifiers for Warm Air Furnaces

wholesaler doings...

WESTERN MICHIGAN DEALER-CONTRACTORS gathered recently at Behler-Young's plant in Grand Rapids to hear manufacturers discuss features of their equipment

▸ OVER 240 HEATING DEALER-CONTRACTORS from the western Michigan area attended a recent dinner meeting held by The Behler-Young Co. in Grand Rapids. Features included a presentation covering Econo Products Co.'s "Zone-A-Trol" control system and a color movie on combustion testing furnished by Bacharach Industrial Instrument Co. Entertainment was provided by the former Michigan state champion barbership quartette — the Extension Chords. An honored guest was Ed Dyksterhouse, (retired) one-time partner in the West Side Sheet Metal Works, who was introduced to the audience as the man who, back in 1920, had given Wayne H. Young, then president of Behler-Young, his first order for heating materials.

▸ TWO NEW VICE PRESIDENTS in the Sid Harvey organization are Richard Kennett, elected vice president of Sid Harvey of Conn., Inc., and Joseph Knob, named vice president of Sid Harvey of Pa., Inc. Mr. Kennett has been with the company for 13 years. Mr. Knob joined the firm's Pennsylvania operation in 1946.

▸ TENN YORK SUPPLY CORP., Nashville, Tenn., will distribute heating and air conditioning products as well as water heaters for the Home Products Div., Rheem Mfg. Co. Founded three years ago, the company has increased its original staff of three employees to 21 persons. Last year the firm moved to new quarters which provided approximately 50 percent more floor space.

▸ HOW ONE WHOLESALER CONTROLS INVENTORY of thousands of low-profit items economically and effectively is the subject of a case history on Aaron & Co., New Brunswick, N. J., wholesaler, recently published by Remington Rand Div. of Sperry Rand Corp. Wholesalers of heating and air conditioning parts and equipment, the Aaron company serves

wholesaler doings

(Continued)

about 600 customers through four outside salesmen, and their stock covers about 13,000 items.

The booklet notes that answers must always be available to the questions: "How many of each item is in the warehouse?" "What's moving?" "How soon should it be re-ordered?" "What price is to be charged?" "What are our customers buying?" It is pointed out that often the items which are left uncontrolled on the theory that the money involved is too little to warrant such action, are those which comprise an important part of a wholesaler's business.

▶ R. J. MILLER and RALPH DIETRICH have established a new Omaha operation—Wholesale Heating & Cooling Supply Co. Offices and warehouse are located at 1223 S. 20th St.

▶ NEW WEST COAST DISTRIBUTOR for "Pop" blind rivets and tools is Reliable Steel Supply Co. Reliable Steel has offices in Los Angeles.

▶ CENTURY REFRIGERATION SUPPLIES, INC., 6101 Delmar Blvd., St. Louis, will handle residential and commercial air conditioners and heating equipment for Welbilt Air Conditioning and Heating Corp. President of Century Refrigeration is Michael Swatsick.

▶ MORE THAN 80 WHOLESALERS of Chrysler Airtemp heating and air conditioning products attended a recent advertising and sales promotion workshop sponsored by the Airtemp Div. "Purpose of our workshop," Richard R. Routh Jr., advertising and sales promotion director for the division, said, "was to assist our distributors in intelligent, effective planning of their advertising and sales promotion funds and to give them the knowledge they need to assist their dealer-contractors with local advertising and promotion campaigns."

Some of the topics discussed were magazine, newspaper, radio and television advertising; direct mail campaigns; cooperative advertising; methods of selecting an advertising agency; budget planning; effective exhibits; sales incentive programs; and working with local better business bureaus. During one session, delegates visited a Dayton television station, where speakers discussed preparation of advertising, local rates, package rates, and effective times for presenting advertising messages.

▶ H. C. GUNDLACH CO., Richmond, Va., will represent Reznor Mfg. Co. in Virginia, will handle distribution of unit heaters, duct furnaces and packaged blowers. The Gundlach company, founded 25 years ago, is located on Bremner Blvd.

appointments . . .

▸ JOHN M. ENGLISBY as manager of electric heating, a newly created position, for the Air Conditioning Div. of American-Standard. Mr. Englisby will coordinate division marketing plans for the introduction and merchandising of electric heating products.

John M. Englisby

William R. Sinks

▸ WILLIAM R. SINKS as sales manager of The Nu-Way Corp. and Sundstrand Engineering Co., succeeding John W. Olson. He will supervise sales of oil and gas heating equipment. Previously Mr. Sinks was with General Controls Co., serving for seven years as an account executive in the midwest regional sales office.

James E. Kuppe

Marvin R. Clemons

▸ JAMES E. KUPPE as manager of residential "Climate Changer" sales for The Trane Co. Marvin R. Clemons has been promoted to manager of the Pensacola sales office, where he previously served for several years as a sales engineer.

▸ ROBERT B. STARNES as president of The Mathes Div., Glen Alden Corp., succeeding Benjamin R. Ebersman, who will continue as a vice president of the parent company. Claude Birdsell has been named sales manager of the division and Sam A. Chambers will serve as his assistant. Mr. Starnes joined The Mathes Co. in 1947 as territory salesman covering western Texas and New Mexico. He has served as a regional sales manager and general sales manager, was elected vice president of the division in 1958. Mr. Birdsell was formerly a district sales manager with headquarters in Oklahoma City. Mr. Chambers was with the U.S. Air Force before joining the division.

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CHECK-LISTS spell out to the prospect:

THERE IS NO REASON why every heating system cannot provide a "comfortable unawareness" that the equipment is operating. Often, the work required for a professional heating man to improve or modernize existing systems is minor. Use of these check-lists will help him to determine how his system stacks up against the standards set for a "Good" system.

22 important check points for good heating performance; among these are:

- ✔ Is the furnace less than 15 years old?
- ✔ Are room air temperature differences within 4 degrees between floor and ceiling when outdoor air temperature is 30 F?
- ✔ Have service calls been rare during recent years?
- ✔ Are fuel costs equal to those for similar houses in the vicinity?
- ✔ Are room air temperature differences within 2 degrees between all rooms (at comparable locations)?
- ✔ Does system include a humidifier?
- ✔ Are occupied areas free from noticeable drafts?
- ✔ Has furnace been checked for efficiency within past 12 months?

SPACE FOR A SALES LETTER BY THE DEALER-CONTRACTOR IS PROVIDED ON REVERSE SIDE OF CHECK-LISTS

ORDER FROM EDITOR AMERICAN ARTISAN

THE HEATING, air conditioning and sheet metal check-lists published in the March American Artisan Modernization Issue can be used as direct mail pieces, for presentation by salesmen, as giveaway items for home shows, etc. Designed to remind home owners of their modernization needs, the two-color check-lists are available at the following prices:

Quantity	Cost
50	$ 0.85
100	1.35
200	2.70
300	4.05
400	5.40
500	6.75
1000	13.50
2000	27.00
3000	37.00
4000	48.00
5000	59.00

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Please rush the following quantities:

_____ Heating check-lists
_____ Summer air conditioning check-lists

Enclosed is my check for $..... to cover reprinting costs.

(Please print)

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Company .....
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I am a dealer .... wholesaler .... manufacturer .... other ....

WHAT HAPPENS WHEN A NATION SPENDS MORE ON GAMBLING THAN IT SPENDS FOR HIGHER EDUCATION?

If you can find any Romans around, ask them. They lived pretty high on the hog in their day. That is, until some serious-minded neighbors from up North moved in. The rest is ancient history.

You'd think their fate would have taught us a lesson.

Yet today we Americans spend twenty billion dollars a year for legalized gambling, while we spend a niggardly four-and-a-half billion for higher education. Think of it! Over four times as much! We also spend six-and-a-half billion dollars a year for tobacco, nine billion dollars for alcoholic beverages, and billions more on other non-essentials.

Can't we read the handwriting on the wall?

Our very survival depends on the ability of our colleges and universities to continue to turn out thinking men and women. Yet today many of these fine institutions are hard put to make ends meet. Faculty salaries, generally, are so low that qualified teachers are leaving the campus in alarming numbers for better-paying jobs elsewhere.

In the face of this frightening trend, experts estimate that by 1970 college applications will have doubled.

If we are to keep our place among the leading nations of the world, we must do something about this grim situation before it is too late. The tuition usually paid by a college student covers less than half the actual cost of his education. The balance must somehow be made up by the institution. To meet this deficit even the most heavily endowed colleges and universities have to depend upon the generosity of alumni and public spirited citizens. In other words, they depend upon *you*.

For the sake of our country and our children, won't you do your part? Support the college of your choice *today*. Help it to prepare to meet the challenge of tomorrow. The rewards will be greater than you think.

It's important for you to know what the impending college crisis means to you. Write for a free booklet to HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

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appointments

(Continued)

▸ CHARLES W. LOCKHART as vice president, sales, for Buffalo Forge Co. Mr. Lockhart joined the firm's engineering department in 1936, has served as manager of the San Francisco sales district and, most recently, as sales manager of the Air Handling Div.

▸ L. BYRON YOUMANS as northeastern district sales manager for Welbilt Air Conditioning and Heating Corp. The northeastern district includes certain counties in Connecticut, New York and New Jersey. Mr. Youmans was previously manager of the air conditioning division of County Seat Supply Co., White Plains, N.Y.

L. Byron Youmans

Daniel P. Carlin

▸ DANIEL P. CARLIN as eastern sales manager of John Wood Co.'s Heater and Tank Div. Mr. Carlin has been with the firm since 1924, has served as manager of the New York district and as manager of Mid-Atlantic district sales. In his new position, he will have charge of sales in all eastern states from Maine to Florida, including Alabama and eastern Tennessee.

▸ R. F. PROTIVA as manager of the Cleveland plant of Heil Process Equipment Corp. He will be in charge of all manufacturing, estimating and product promotion. He has served in various capacities including eastern sales manager.

R. F. Protiva

Robert Groll

▸ ROBERT GROLL as manager of the West Hartford, Conn., branch office of Ilg Electric Ventilating Co. He replaces William McNeilly, who has retired after 42 years of service. John F. Giacin, sales engineer, has joined the staff of the Cincinnati sales office. Other new sales engineers are Fred C. Espey, who

appointments

(Continued)

has joined the San Francisco staff, and Edward J. Bishop, who has been assigned to the Pittsburgh sales office.

▸ HARRY H. SPEAKES, formerly Seattle district representative for American-Standard Air Conditioning Div., as western district manager for the newly formed western sales district. Mr. Speakes has been with the division since 1953 covering the pacific northwest area. Elmer L. Jacobs, formerly with Lennox Industries Inc., has been named Portland district representative and will cover the Pacific northwest area. Other new district representatives are Ralph W. McCarty, San Francisco; Lou Polett, Los Angeles; and Walter A. Haberl, Denver. Mr. McCarty will cover northern California and Nevada; Mr. Polett, Arizona and southern California; and Mr. Haberl, the Denver, Colorado Springs, Salt Lake City, Albuquerque and El Paso areas.

▸ JAMES W. MCGUIRE, 370 Lexington Ave., New York City, as exclusive sales agent of "Statronic" electronic air cleaners in metropolitan New York, central New York State, Connecticut and Rhode Island for CRS Industries, Inc. James R. McQuaide, 2042 Amber St., Philadelphia, has been named exclusive sales agent in metropolitan Philadelphia, eastern Pennsylvania, southern New Jersey and all of Delaware.

▸ MILES I. BAUMAN as district sales manager for Ramset Fastening System, part of the Winchester-Western Div., Olin Mathieson Chemical Corp. He will be responsible for sales in Indiana, Illinois and western Kentucky. Victor Christian Jr. has been named Georgia sales representative.

▸ JOHN F. SCANLON INC. as representative in the Philadelphia area for Barnebey-Cheney Co.

appointments

(*Continued*)

▶ ROBERT L. TAYLOR as a sales representative for Bohn Aluminum & Brass Corp. in the Rochester-Buffalo-Syracuse area. He will handle all of the Bohn company's products except heat transfer equipment. New sales representative handling heating and cooling coils for the company's Danville Div. is Foulds Associates, 78 Whiting St., Revere, Mass. The Foulds firm will cover the New England states.

Obituaries

A. V. Hutchinson

A. V. HUTCHINSON, executive secretary of the American Society of Heating, Refrigerating and Air-Conditioning Engineers until he was named "executive secretary emeritus" last year, died in Stockwell, Ind., June 6, 1960. He had served in a similar capacity for many years for the precedent organization, the American Society of Heating and Air-Conditioning Engineers.

Mr. Hutchinson joined the American Society of Heating and Ventilating Engineers (as ASHAE was then known) in 1922 as manager of publications. He was appointed secretary in 1926 and executive secretary in 1950. When ASHVE became ASHAE, he continued as executive secretary and manager of publications.

He served with the U.S. Army in 1918-19, was a member of the Society of American Military Engineers and the American Legion.

R. Fenton Fisher

R. FENTON FISHER, vice president, sales, for the past 26 years for the Mercoid Corp., died May 21, 1960, while aboard the SS President Wilson returning from Yokohama, Japan. For many years, Mr. Fisher was in charge of sales for the company's eastern area and was located in New York City. During the past three years, his activities were concentrated on the West Coast, and he maintained headquarters in Santa Barbara, Calif. He was well known in the heating field and had served on many committees of the Oil Heat Institute of America. He was a member of the Old Timers Club of the Oil Burner Industry.

He is survived by his widow, two daughters and four grandchildren.

CLASSIFIED ADVERTISING

Classified Section: Rates for classified advertising are 15 cents for each word, including heading and address. One inch $7.00. Count nine words for keyed address. Minimum $2.50 for each insertion.

AGENTS WANTED

Manufacturer of a new, outstanding, fully-automatic humidifier desires increased representation. Unit has simple and unique operation with only one moving part. Has been tested and proven in the field. Give territory covered and other lines handled. Address Key 1190, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

SALES REPRESENTATIVE — major heating, air conditioning and ventilating distributor requires representation in Flint, Saginaw, Bay City area. Technical experience required. Splendid opportunity for right man Please submit picture with application detailing experience. Address Key 1192, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

MANUFACTURER'S REP. — Choice Territories Open! Excellent opportunity to represent leading manufacturer of air conditioning and heating Grilles and Registers. Desire replies from those now selling a kindred line of heating and ventilating accessories. Reply to Sales Manager, Standard Stamping & Perforating Company, 3131 W. 49th Place, Chicago 32, Illinois.

EQUIPMENT WANTED

Wanted: Close out lots of warm air residential heating equipment. Write giving description and price to E. L. Bilek, 2025 Zollinger Road, Columbus 21, Ohio.

FOR SALE

TECHNIQUES OF DUCT WORK ESTIMATING

Learn How the Pros Figure The Big Jobs By Poundage-Square Footage — Linear footage — Fittings. This information is ordinarily very closely guarded and is invaluable to the progressive shop or individual.

Send check or money order $2.50 made out to CASH To

Key 1188,
American Artisan
6 N. Michigan Ave.
Chicago 2, Ill.

SITUATION OPEN

SALESMAN WANTED — Established heating, ventilating and air conditioning wholesaler has excellent opportunity for well-qualified applicant in Southern Michigan area. Enclose picture with resume of experience. Address Key 1191, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.

SITUATIONS WANTED

MOVING TO OCALA, FLORIDA from Massachusetts — Engineer, with 30 years experience in designing and selling air handling systems for heating, air conditioning, and ventilation. I would like full or part time work. Richard B. Hudson, 1504 Lake Weir Ave., Ocala, Florida.

SHEET METAL ESTIMATOR — I have had 15 years experience in this field. Also experience in roofing, air conditioning, heating and cooling and refrigeration. I am 35 years old, in good health, veteran of World War Two. Ambitious, industrious, H. S. education, ICS courses in heating, sheet metal, and estimating. Location Midwest Preferred. Address Lawrence H. Mears, Exmore, Va.

Classified Advertising

Is the quick, economical way to find what you're looking for. Check the page each and every issue for real bargains and hard to find items. It's a quick and sensible means too, of disposing of tools, equipment, and anything else for which you no longer have use. Rates appear on the classified page.

index to

ADVERTISERS

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.

3¾% interest on New U.S. Savings Bonds now in effect

and the Bonds you already own are better than ever, too!

Now U. S. Savings Bonds are a better buy than ever in three important ways:

- *All Series E and H Bonds bought since June 1, 1959, now earn 3¾% interest when held to maturity.*
- *Older Bonds will also pay more—an extra ½%, from June 1 on, if you hold them to maturity.*
- *All Series E Bonds, old or new, now carry an automatic extension privilege; they'll keep paying liberal interest for 10 years beyond maturity.*

Three big new *dollar* benefits that make it smart to buy new Bonds—and hang on to the ones you have!

40 million Americans own Bonds

More people than ever own Bonds today. There's simply no easier, safer, more *American* way to save.

You can buy them through the Payroll Savings Plan at work; you can buy them where you bank. Either way, your U.S. Savings Bonds help build a more secure future for you, your family, and your country. And now they're better than ever!

HELP STRENGTHEN AMERICA'S PEACE POWER

SAVE WITH U.S. SAVINGS BONDS

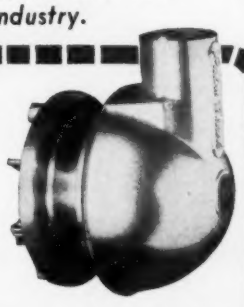
The U. S. Government does not pay for this advertising. The Treasury Department thanks The Advertising Council and this magazine for their patriotic donation.

. . . move your products in greater volume through consistent advertising in this

Service Section . . .

Rates for display space in the Service Section are $12.00 per inch per insertion. One-inch minimum space accepted. Closing date — twentieth of the month preceding issue.

LOOK! PROVEN - *the most important advance-designed for the betterment of the forced air heating industry.*



Palm Beach trademark

SOLVES THE PROBLEMS OF FORCED AIR HEATING!

automatically modulates blower speeds
Send for **FREE** illustrated brochure

NATIONAL MODULATION CO. 2730 N. Hy. 61, St. Paul 9, Minn.

✓ **AIR LOSS**

✓ **AIR DISTRIBUTION IN 30 SECONDS**

with safe • fast • positive

Kilgore SMOKE CANDLES

Write Today For Catalog
Kilgore, Inc., Westerville, Ohio

MAKE YOUR PLANS NOW FOR ADEQUATE SPACE IN THE JANUARY 1961 ISSUE WHICH WILL CONTAIN OUR DIRECTORY SECTION

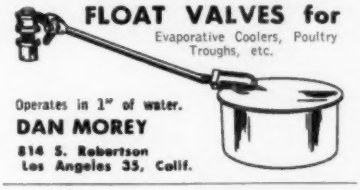
MONMOUTH HUMIDIFIERS

Made in various capacities up to 420,000 BTU

Write for descriptive literature, prices and discounts. Effective control of humidity is positively assured by installing Monmouth Humidifiers. Simple installation and greater customer satisfaction mean larger profits.

CLEVELAND HUMIDIFIER CO.
7802 Wade Park Ave. Cleveland 3, Ohio

FLOAT VALVES for Evaporative Coolers, Poultry Troughs, etc.



Operates in 1" of water.

DAN MOREY
814 S. Robertson
Los Angeles 35, Calif.

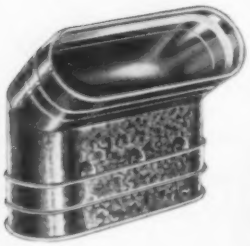
SO SOFT RUBBER KNEE PROTECTORS
EVERY ROOFER SHOULD HAVE A PAIR.
PRICE $2.50.
ORDER YOURS TODAY.

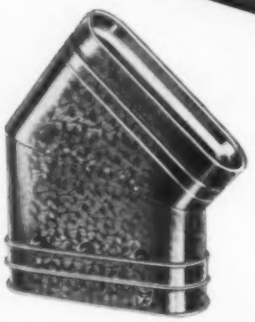
JOHNSON LADDER SHOE CO.
EAU CLAIRE, WIS.

H & C adds 5"Oval to its line of

METLVENT

GAS VENT PIPE & FITTINGS





Addition of the 5" oval pipe and fittings further extends the great advantages of the METLVENT line. Like all METLVENT members it is exceedingly easy to assemble and install . . . safe and secure. Easy to assemble because there are no loose parts. Inner and outer pipes are curled together and properly spaced PERMANENTLY. They go together like slipping a hand in a glove.

No screws at the joints are required. The locking ring is simply slipped down over the tabs which instantly engage and lock securely.

Bottom edges of all members are curled to give them rigidity, to guard against damage and insure the maintenance of their original perfect shape for easy joining.

Any way you figure it, you'll find it pays to use METLVENT on all your installations. The line is complete and prompt deliveries are assured by large inventories at the factory and adequate stocks at H&C Jobbers thru-out the nation.

INDOOR COMFORT

HART & COOLEY MANUFACTURING CO.

500 EAST EIGHTH ST., HOLLAND, MICHIGAN

IN CANADA: HART & COOLEY MANUFACTURING CO., FORT ERIE, ONTARIO

013

WORLD'S LARGEST PRODUCERS OF REGISTERS and GRILLES

No. 406 "DIFFUSAIRE"...

THE LAST WORD IN 18" DIFFUSERS

EASY INSTALLATION

As indicated in the accompanying illustration, "FLEXI-TAB" fold-down boot retainers are provided in the base to firmly hold front and rear sides of the boot. "Knock-outs" permit increasing the boot opening from the normal 12 inches to 14 inches. Face screws are conveniently located at the top to further increase ease of installation.

Excellent appearance, sturdy construction, outstanding air handling capacity and convenience of installation mark the H&C No. 406 as unquestionably the finest diffuser of this type. Note the following details.

ALL STEEL with the tried and proven sturdiness that is complete assurance against warping.

GREATER AIR HANDLING CAPACITY . . . as much as 25% more than some diffusers of this type . . . due to a combination of a full 38 sq. inches of free area and the fact that the entire face is in one upwardly slanted plane.

PERFECT AIR PATTERN . . . the curvilinear fins in conjunction with the horizontal fins result in a perfect air pattern to blanket the window or wall area.

BALANCING STOP permits easy and accurate balancing of the system at the face of the Diffusaire.

SEE THE NO. 406 AT YOUR H&C JOBBERS

HART & COOLEY MANUFACTURING CO.

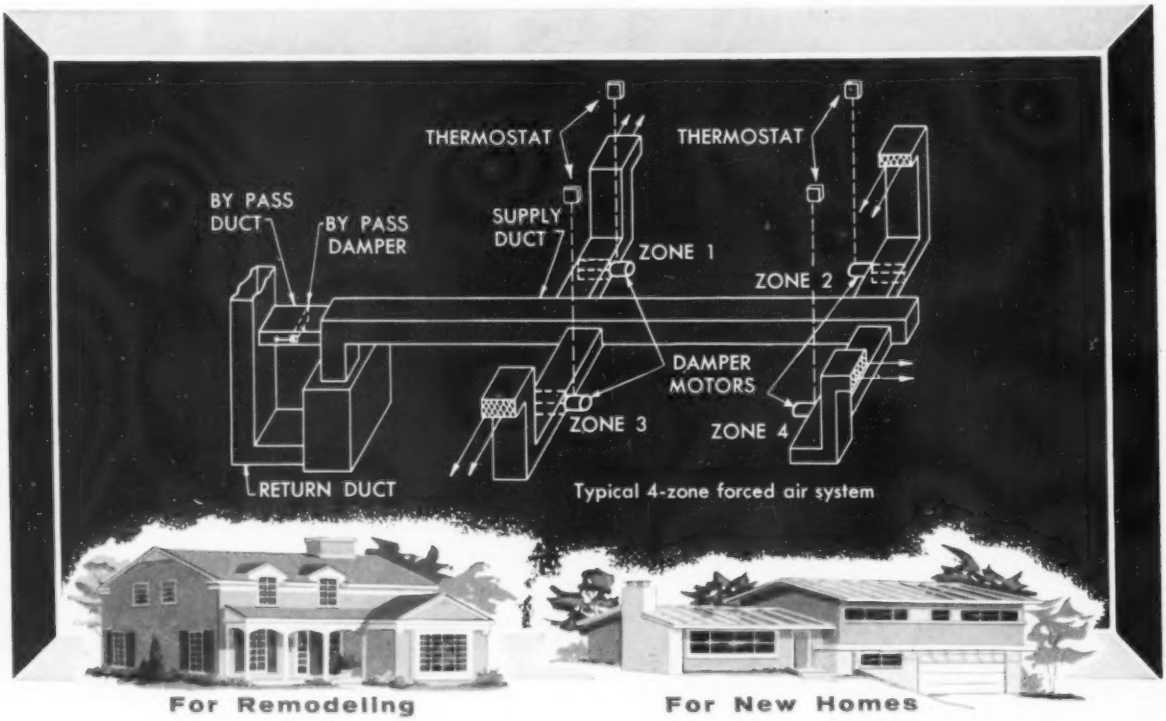
500 EAST EIGHTH ST., HOLLAND, MICHIGAN

IN CANADA: HART & COOLEY MANUFACTURING CO., FORT ERIE, ONTARIO

014

AN EXTRA PROFIT OPPORTUNITY...

White-Rodgers "Zone-Air" Control Package For Zoning Forced Air Systems...At Low Cost



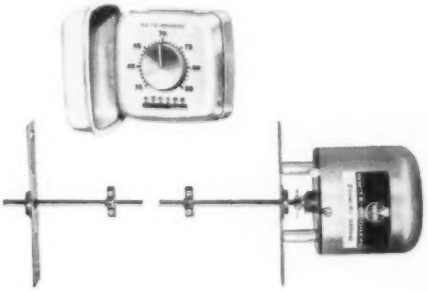
Home owners are beginning to demand the comfort of zoned heating. Here's a new, fast growing market that will make handsome profits for those alert dealers and contractors who capitalize on the advantages of White-Rodgers "Zone-Air" . . . which provides reliable, customer-satisfying zone control at a price easy to sell.

Zone-Air increases home comfort; raises system efficiency; boosts property value . . . yet lowers fuel bills; keeps zoning installation costs down with simplified design and low-voltage wiring.

Cash in on these extra profits . . . offer Zone-Air control on all the jobs you install.

Write for Bulletin R-1637 giving complete information.

HOW IT WORKS . . . an attractive thermostat in each zone controls a silent motorized damper installed on the air supply to its particular zone. Whenever the thermostat calls for heat, the motor opens the damper—closes it when the right temperature is reached. Where required an "equalizer" by-pass damper is available to stabilize air velocities.



WR

WHITE-RODGERS

ST. LOUIS 6, MISSOURI
1209 Cass Avenue

TORONTO 8, CANADA
611 Gerrard St. East

212